DOCUMENT RESUME

ED 083 935 HE 004 808

AUTHOR	Nyre, Glenn F., Ed.
TITLE	Studies of College Students and Alumni: Selected Dissertations in Higher Education.
INSTITUTION	California Univ., Los Angeles. Center for the Study of Evaluation.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C.
REPORT NO	CSE-RR-88
PUB DATE	Jul 73
NOTE	203p.
EDRS PRICE	MF-$0.65 HC-$9.87
DESCRIPTORS	*Alumni; Career Choice; Civil Rights; *College Students; *Doctoral Theses; Educational Benefits; Educational Experience; Females; *Higher Education; Political Attitudes; Religious Factors; *Student Attitudes; Student Characteristics

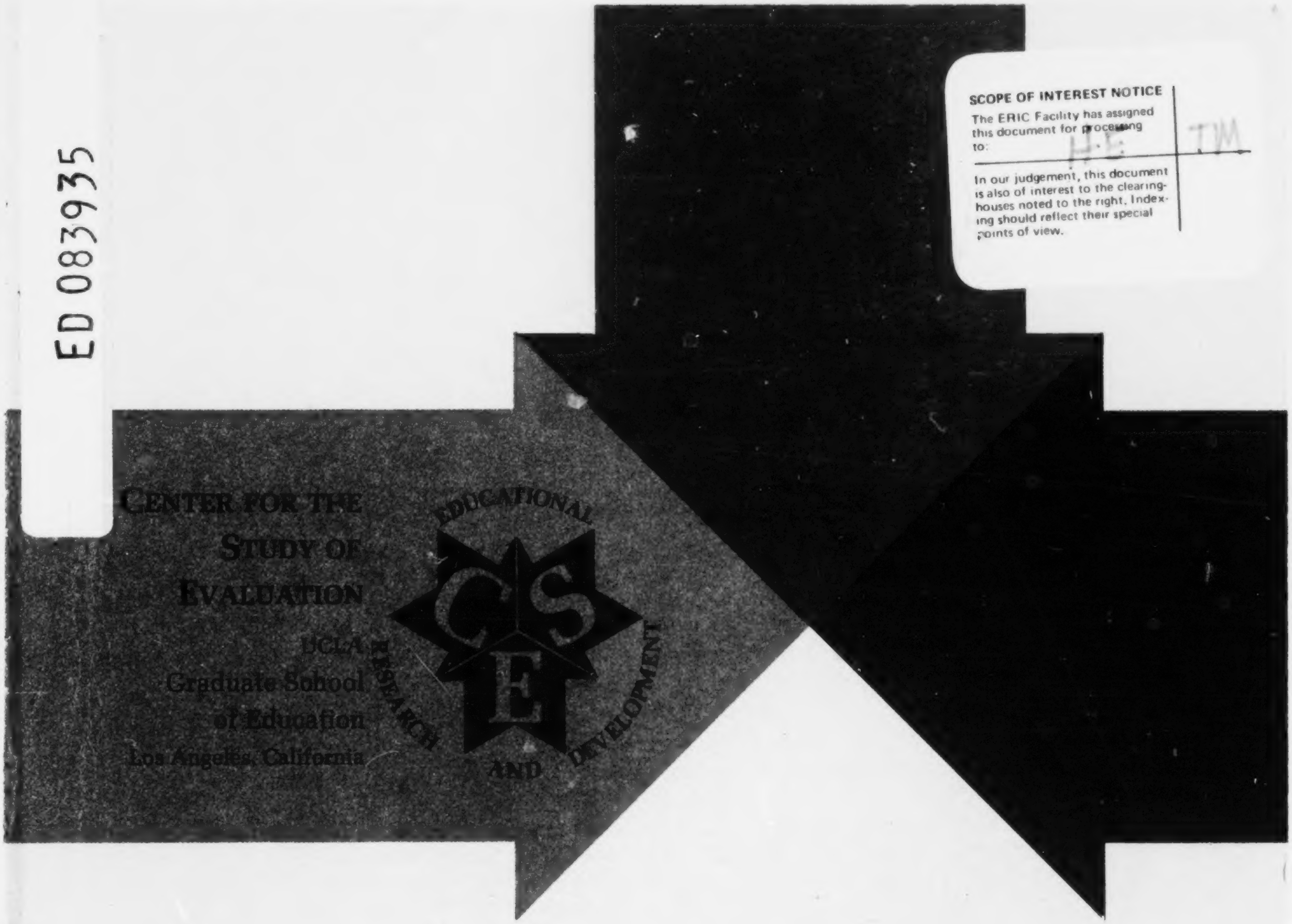
ABSTRACT

This document reports eight selected dissertations in higher education each drawing upon some substantial part of a national data bank concerning colleges and universities. The data bank consisted of questionnaire returns obtained during the the calendar year 1969 from representative samples of freshmen, upperclassmen, and alumni in a total of 88 different colleges and universities. The reports cover topics concerning: upperclassmen's satisfaction with college; correlates of graduate degree aspirations; the relationship between religious background and intellectuality in college; major field transfer: the self-matching of university undergraduates to student characteristics; the personal and environmental factors in role identification and career choice of women; political participation and civil rights attitudes of college alumni in the class of 1950; alumni perception of educational benefits as related to college experiences and institutional types; and an analysis of outcomes of higher education. (MJM)

ED 083935

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: HE

In our judgement, this document is also of interest to the clearinghouses noted to the right. Indexing should reflect their special points of view. TM



CENTER FOR THE
STUDY OF
EVALUATION
UCLA
Graduate School
of Education
Los Angeles, California

STUDIES OF COLLEGE STUDENTS AND ALUMNI: SELECTED DISSERTATIONS IN HIGHER EDUCATION

Edited by Glenn F. Nyre

CSE Report No. 88
July 1973

HE 004 808

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

FILMED FROM BEST AVAILABLE COPY

CENTER FOR THE
STUDY OF
EVALUATION

MARVIN C. ALKIN
DIRECTOR

UCLA Graduate School of Education

The CENTER FOR THE STUDY OF EVALUATION is one of eight educational research and development centers sponsored by the U.S. Office of Education, Department of Health, Education and Welfare. Established at UCLA in 1966, under provisions of the Cooperative Research Act, CSE is devoted exclusively to the area of evaluation.

The mission of the Center is to conduct research and development activities for the production of new materials, practices and knowledge leading to the development of systems for evaluating education which can be adopted and implemented by educational agencies. The scope of activities includes the development of procedures and methodologies needed in the practical conduct of evaluation studies of various types, and the development of generalizable theories and concepts of evaluation relevant to different levels of education.

This publication is one of many produced by the Center toward its goals. Information on CSE and its publications may be obtained by writing to:

Dissemination Office
Center for the Study of Evaluation
UCLA Graduate School of Education
Los Angeles, California 90024

*The Center is presently funded by the National Institute of Education.

ED 083935

STUDIES OF COLLEGE STUDENTS AND ALUMNI:
SELECTED DISSERTATIONS IN HIGHER EDUCATION

Edited by
Glenn F. Nyre

With an introduction by
C. Robert Pace and James W. Trent

CSE Report No. 88
July 1973

Higher Education Evaluation Program
Center for the Study of Evaluation
UCLA Graduate School of Education
Los Angeles, California

TABLE OF CONTENTS

Introduction 1
C. Robert Pace and James W. Trent

Upperclassmen's Satisfaction With College 17
Raymond Cook

Correlates of Graduate Degree Aspirations 39
Margaret A. New

The Relationship Between Religious Background and Intellectuality in College 69
Michael B. Schleyer

Major Field Transfer: The Self-Matching of University Undergraduates to Student Characteristics 97
Lawrence K. Kojaku

Women: Personal and Environmental Factors in Role Identification and Career Choice 125
Felice J. Karman

Political Participation and Civil Rights Attitudes of College Alumni: Class of 1950 145
Paul W. Purdy

Alumni Perception of Educational Benefits as Related to College Experiences and Institutional Types 161
Stuart L. Farber

An Analysis of Outcomes of Higher Education 181
Sonja P. Jacobson

References 193

INTRODUCTION

One of the special benefits in undertaking any large scale survey is that the resulting data bank provides a rich resource for a variety of special studies over and above the primary analyses that are made of the survey data. The present volume reports the results of eight such studies, each drawing upon some substantial part of a national data bank concerning diverse colleges and universities and each undertaken as a doctoral dissertation by graduate students in the Higher Education Program of the UCLA Graduate School of Education.

The data bank to which we refer consists of questionnaire returns obtained during the calendar year 1969 from representative samples of freshmen, upperclassmen, and alumni in a total of eighty-eight different colleges and universities. Most of the institutions participated by obtaining data from all three of these groups, while others participated in only one or two of the sample surveys.

The alumni were representatives from the graduating class of 1950. Approximately 58 percent of those who received the mailed questionnaire returned it. Upperclassmen were tested in the spring of their junior year in most schools. In a few, however, the data were obtained from seniors in the fall. Approximately 66 percent of the upperclassmen who were selected for inclusion in the samples completed the questionnaires. The freshmen were tested during the summer or fall of the same year, at the time of orientation programs or the first week of classes. Approximately 80 percent of the freshmen who were included in the sample completed the questionnaires. The total number of responses for each group was approximately 8,300 alumni, 7,500 upperclassmen, and 10,500 freshmen.

The institutions selected for participation in the national survey were chosen to reflect examples of various types of institutional environments as follows:

1. highly selective liberal arts colleges, private, non-sectarian
2. strongly denominational liberal arts colleges, Protestant and Catholic
3. general liberal arts colleges, non-sectarian or moderately denominational
4. highly selective universities, public and private
5. general comprehensive universities, public and private
6. state colleges and other universities having less extensive graduate programs than comprehensive universities
7. colleges having a major emphasis on teacher education
8. colleges and universities having a major emphasis on engineering and sciences

More detailed information about the national survey has been reported elsewhere and will not be repeated here.[1] These publications present copies of the freshmen, upperclassmen, and alumni questionnaires, specific information about the sampling procedures and the response rates, the identification of institutions participating in each of the three surveys, the classification of these institutions into the eight types or categories described above, and the composition of various scales, scores, and indexes that have been derived from various combinations of items in the questionnaires. An overview describing the purposes, the design, and the content of the national survey has also been published.[2]

A brief description of the general content of the three questionnaires follows, so that readers who are not familiar with these other publications may still have some pertinent information about the substance of the national survey. Each of the three questionnaires was essentially similar in content, having only minor variations owing to the status and age of the respondents. For example, in both the student and alumni questionnaires there are items about father's occupation; in the alumni questionnaire there are also items about the alumni's occupation.

---

[1] See, for example: A User's Guide to the Institutional Profiles (Center for the Study of Evaluation, 1971), and the National Study of College Students and Alumni: An Account of its Procedures, Benefits, and Impact. (CSE Working Paper No. 23, March, 1973).

[2] A National Evaluation of Higher Education: Plans and Prospectives. (CSE Report #51, 1969); a shorter version of this report also appeared in The Journal of Higher Education, December, 1969.

In general, the content of each questionnaire is divided into three major sections: criterion variables, school and college experience variables, and background information and personal traits. The questionnaires begin with a series of activity scales designed as measures of interest and involvement in important areas of contemporary culture: community affairs, national and state politics, international and intercultural affairs, art, music, drama, literature, religion, and science. An additional scale in the alumni survey was on the topic of education. The extent to which people engage in certain kinds of activities is presumably a reflection of their interests, values, satisfactions, and commitments. Some items in each of the scales refer to some activities that are commonplace and easy to do; others require more effort and thus imply a deeper or more intense level of interest and involvement. A person's score on an activity scale is simply the number of activities he has checked.

There is then a series of items under the heading "The Changing Society". These are statements descriptive of major trends that are thought to be occurring in American society. They refer to trends in the areas of education, the labor market, economy, government planning, societal values, the environment, and resources. There are two kinds of responses to these items: one indicates agreement or disagreement with the statement as reflecting a trend; and the second response, assuming that it is a trend, indicates whether the individual regards it as generally desirable or undesirable. The intention was to develop a test of awareness of major social trends and a measure of the desirability of such trends.

Next there is a series of items consisting of viewpoints about various social issues: the role of government in world affairs, equal opportunities for women, and civil rights.

Following that is a section entitled "Educational Benefits". This consists of a list of seventeen fairly typical objectives of higher education. The respondent is asked to indicate the extent to which he feels he has made progress toward or been benefited in the attainment of these objectives in college. There are various ways in which the objectives can be combined to form larger categories. Some deal with vocational benefits, some with rather general liberal education benefits, and some with personal and social benefits.

All of the above parts of the questionnaire can be regarded as criterion or outcome measures.

The next major section includes, in the freshmen and upperclassmen questionnaires, a set of items descriptive of the college environment. These items were selected from the College and University Environment Scales (CUES) published by Educational Testing Service.[3] The freshmen indicate what they think is or expect will be generally true about the college they have just entered. Upperclassmen who have lived in the college environment for several years are asked to report what in their experience they perceive as characteristic or generally true of the campus.

Other items under the general heading of "School and College Experience" include identification of one's major field, self report of college grades, participation in various sorts of extra-curricular activities, plans for further education, aspects of the college experience that stand out in one's memory, and some corresponding information about the type of high school attended, high school achievement, and participation in various high school extra-curricular activities. The items that are listed under the headings of things that stand out in one's memory are grouped into several subcategories which are used to construct a scale. One scale, for example, measures the extent to which peer relations stand out in memory about the college experience, and another measures the extent to which academic events were viewed as particularly memorable.

---

[3] See Pace 1969b.

The third and last section of the questionnaires deals with a variety of personal information. It includes the usual kinds of census data such as age, sex, marital status, number of children, ethnic background, occupation, income, religious and political affiliation, and various areas of the country in which the respondents have lived. Under the general heading of "Personal Traits" there are combinations of items that are totaled to provide an estimate of three traits that in combination are related to what may broadly be described as intellectual disposition. One of these is autonomy. A high score on that combination of items suggests a general independence of traditional authority. Another trait is labeled complexity, in which a high score indicates a tolerance for ambiguous situations and an enjoyment in dealing with complex and novel ideas. A third trait, labeled theoretical orientation, describes individuals having a preference for using the scientific method in thinking and tending to be logical, analytical and critical in their approach to problems.

In summary, the overall content of the questionnaires includes a variety of criterion measures--activities, awareness of social change, viewpoints with respect to some social issues, and self-ratings of progress toward the attainment of different educational objectives; a variety of information about the nature of the school and college experience and the college environment; and finally, items related to personal background and personal characteristics. One of the major differences between this survey and others is in the range of criterion measures that have been included.

Each of the first five dissertations that are reported in the present volume draw upon some aspect of the upperclassmen and/or freshmen questionnaire data.

In the first study, Raymond Cook explores factors that are related to students' satisfaction with their college experience. Overall, it is quite clear that most students report being well satisfied with college despite numerous newspaper and other accounts which might lead one to think otherwise. Among the factors that are most related to student satisfaction are the scholarship, community, and awareness aspects of the college environment as measured by an abbreviated version of the CUES, the students' overall feeling of progress toward the attainment of various educational objectives, their college grades, and the extent of their contact with faculty members and counselors. Again, and contrary to popular mythology, there was no disproportionately large number of dissatisfied students from the large and so-called bureaucratic, impersonal universities. Instead, the highest proportions of dissatisfied students were found among those attending the general run of small liberal arts colleges and students attending colleges having a predominant emphasis on engineering and the sciences. Little influence on satisfaction with college life was attributable to residence at college, to participation in extracurricular activities, or to the major field in which one studied, except for engineering majors who tended to be the least satisfied with their college experience.

The criterion variable in Margaret New's dissertation was aspiration for further education. Who plans to go to graduate school and what characteristics and experiences are associated with those aspirations? Clearly the most influential determinant was sex. Relatively few women had plans for further education, especially past the master's level. Beyond that, however, high school grade point average, an index of cultural sophistication, and level of mother's education were all positively related to aspirations for further education. The college experience factors of participation in extra-curricular activities and general satisfaction with college life were also related to educational aspirations.

Michael Schleyer's dissertation explores relationships between religious background and intellectuality. Intellectuality is defined as receptivity to change, critical thinking, openness to new ideas, and non-authoritarianism. Religious background was classified as Catholic, Jewish, or Protestant, with Protestant being further subdivided into conservative-fundamentalist, moderate, and liberal. His results clearly indicate that religious background is strongly associated with intellectual characteristics. Students from conservative-fundamentalist Protestant backgrounds rank lowest on intellectuality both in the freshmen sample and the upperclassmen sample, but there are, nevertheless, substantial gains in the direction of intellectuality that can be inferred by comparing the freshmen and upperclassmen responses. Unlike previous studies, in which Catholic students have often been found to rank low on intellectuality, Schleyer's results indicate that students from Catholic backgrounds are quite similar to those from moderate Protestant backgrounds, and in some cases are similar to those from liberal Protestant backgrounds. The gains in intellectuality that might be inferred from differences between the freshmen and upperclassmen cross-sectional responses which were often greater for Catholic students than for the students with liberal Protestant backgrounds. In general, the liberal and moderate Protestant groups were similar, both in the freshmen survey and in the upperclassmen survey. Students ranking highest by far in intellectuality both as freshmen and upperclassmen were those from Jewish backgrounds.

Lawrence Kojaku's dissertation explores the phenomena of students who change their major field during college. The self-matching theory of major field transfer was clearly supported by his data. This theory holds that students are at least partially motivated to leave a major field because they perceive some disparity between their own attitudes and interests and the characteristics of fellow students in their initial major field choice. Kojaku's results indicate that students who change majors select their subsequent major field to a marked degree on the basis of whether they perceive their characteristics to match those of the students who are majoring in that field. As a result of this self-matching process the characteristics of upperclassmen are more clearly differentiated among the different fields and are also more similar or homogeneous within each field than are the freshmen choices of majors.

In the next dissertation to be reported, Felice Karman looked at the background and characteristics of women who planned to enter non-traditional, that is, primarily male-dominated occupations. The number of such women in the sample she studied was quite small, being only 6 percent of the total. Among those planning to enter non-traditional fields, however, she found that they came primarily from a higher family income level, from families in which the mother was a college graduate, and from a Jewish background and had personal characteristics and attitudes that ranked them relatively high with respect to theoretical orientation and to liberal viewpoints regarding the role of women.

The next three dissertations examined data from the alumni survey. Paul Purdy was concerned with adult participation in politics and with tolerant attitudes with respect to civil rights and minorities. Among the variables associated with political participation were: having majored in social sciences or humanities in college, having participated in extra-curricular activities related to politics or student government, obtaining better than average grades, and having attended an institution classified as a selective university or a selective liberal arts college. The same variables were also related to attitudes towards civil rights and minorities. Among the factors related to low scores on civil rights tolerance were identification with the Republican party, and having majored in some vocational field such as business when in college.

Stuart Farber's dissertation examined several aspects of the college experience in relation to the alumni's self-ratings of progress toward three categories of educational objectives: vocational objectives, personal and social objectives, and liberal educational objectives. The type of institution one attended and the field in which one majored were related to progress toward the attainment of all three categories of educational benefits. Whether one resided on or off the campus during his college years had little or no relationship to the perception of vocational or liberal education benefits but was quite clearly related to the perception of personal social benefits. One of the interesting findings of Farber's study was that the extent of contacts with faculty members and with counselors was positively related to the attainment of all three types of educational benefits. Participation in extra-curricular activities was quite clearly related to the attainment of personal and social benefits, but was least related to the attainment of vocational benefits.

Sonja Jacobson's study addressed the question: What happens to similar kinds of students who enroll in different kinds of institutions? Taking a sample of male alumni, she examined the responses to various criterion measures for the total group of graduates from each of the eight institutional types. Then she examined the responses to the same criterion measures for a selective group, described as "college prone" because of their high scores on an input measure of academic quality. Although some of the results are conflicting or not readily explanable, she found generally that controlling for input (college prone males only) did not reduce the "influence" of the environment on such outcome measures as participation in activities related to community affairs, politics, religion, music, or educational benefits related to personal and social development.

There are three other studies in various stages of progress, which are not included in this volume, that also draw upon segments of the national data bank. One of the studies, proposed by Julia Ory, is examining the effects of increased specialization of experience both in college and in post-college study and employment upon the opinions, values, and breadth of interests and activities of a sample of men from the alumni survey. June Warren is performing a content and frequency analysis of the free-response comments written by upperclassmen and by alumni. On the last page of the questionnaires, respondents were invited to write whatever they wished about themselves, their education, the questionnaire, the general condition of society, or any other matter. The third study, which is virtually completed but was not available for fuller description in the present monograph, was done by Judd Adams. He examined the relationships between membership in various campus subgroups and their effect upon students' perceptions of characteristics of the college environment. The membership groups include college residence groups such as dormitories, fraternities or sororities; various extra-curricular activity groups; and different major fields or schools within the university. Membership in any one of these subgroups has relatively little impact upon students' perceptions of the environment when the environment scores are examined in the manner that has customarily been used in reporting the results on the CUES. However, when multivariate analyses are undertaken, and one looks at the combined influence of various group memberships upon the proportion of people regarding individual items in CUES as generally true about the campus environment, it is clear that there are substantial combined influences upon the environmental perceptions--a finding which emphasizes the need for considering more directly the important subenvironments that are often found not only in complex universities but even within the presumably more homogeneous liberal arts colleges.

In planning this volume we faced the choice between asking each doctoral student to prepare a condensed version of his own dissertation or having some one person prepare a short version of all of the dissertations. Partly because of the inevitable differences in writing style, partly because not all of the former students were still residing in southern California, and partly because when a person has written a work of some 200 or more pages in length the prospect of attempting to condense it into a bare 20 or 30 pages is a formidable one, we chose the second of these two alternatives. For these reasons, we asked Glenn Nyre to undertake the job of writing a condensed version of all eight of the dissertations. In retrospect, we are convinced that this was a wise choice. The general format in presenting each of the studies is roughly comparable and the highlights of each have been selected with a good sensitivity to their relative importance for inclusion in a condensed version. We are extremely grateful to Mr. Nyre for his thoughtful and perceptive condensations of these eight dissertations.

Although we have included in the present volume only those dissertations that have drawn on some substantial part of our national data bank, we should note that there have been many other dissertations that have been stimulated by and contributed to the Higher Education Evaluation Program since its inception in 1966 as part of the Center for the Study of Evaluation. The initial prospectus for establishing the Center had noted that among the important contributions to the advancement of evaluation would be a substantial expansion in the range and relevance of criterion and contextual measures. Especially if one is concerned about evaluating large and complex educational programs, and doing so in their natural setting, one needs ways of characterizing those complex settings. This might involve the development of measures for describing the environment or atmosphere, the nature and interaction of subgroups within the larger environment, the organizational and administrative factors that might be involved, and other aspects of the ongoing educational process. Also, the commonly available measures of subject matter achievement and of personality traits are not sufficient for assessing the variety of outcomes that may be pertinent.

Some of our efforts to extend the range of criterion and contextual measures are embodied in the content of the freshmen, upperclassmen, and alumni survey questionnaires. The dissertations listed below represent further contributions in this direction. In some cases a new measure was constructed and pretested as the primary purpose of the study. In other cases the outlines of an instrument that might be developed are proposed. And in still other cases, the importance of measuring a certain aspect of the college environment or context was documented.

> Barton Herrscher: "Patterns of Attainment and the Environmental Press of UCLA Student Groups," 1967. Herrscher's study pretested a list of educational objectives subsequently used in our national survey. His study also influenced some of the other questions we

included in our national survey, and documents the importance of measuring subcultures in complex environments.

Lloyd Ring: "Organizational Characteristics of Colleges and Universities: A Systems Description," 1968. Ring developed and pretested an instrument for characterizing organizational functions of colleges and universities, based on the theories of Katz and Kahn.

Richard Nystrom: "UCLA: An Interpretation Considering Architecture and Site," 1968. One element of Nystrom's study was a questionnaire designed to determine how students reacted to various architectural styles on the UCLA campus and the extent to which they felt that the esthetic qualities of the campus were important to them personally and educationally. This aspect of Nystrom's study documents the importance of one aspect of the college environment.

Jere Martin: "A Comparison of Academic Activities Reported in Student Logs at Selected Institutions of Higher Education," 1969. The measure of learning styles that we have included in the Higher Education Measurement and Evaluation KIT[4] was based on Dr. Martin's study.

Patrick Partridge: "An Exploratory Study of Management Styles and Institutional Functions in Selected Urban Public Junior Colleges, " 1969. Partridge developed instruments for characterizing authoritarian vs participatory management styles and related the results to the adaptive and innovative functions of the institutions.

Richard Seligman: "Student and Administrator Perception of Campus Discipline," 1969. The instruments developed by Seligman enabled institutions to be characterized along strict vs permissive dimensions, and revealed discrepancies between administrator vs student perceptions.

Sandra Clark: "An Exploratory Analysis of E.O.P. Women in One UCLA Residence Hall," 1969. Clark's study concluded with a set of questions designed to assess how well administrators were prepared to understand and deal with the problems of disadvantaged black students. A refinement of these questions could be used in a pre- and posttest design to evaluate the impact of experience upon understanding.

Jane Permaul: "Behavioral Differences Among Selected Organized Student Groups," 1970. One aspect of this study was a sociometric device for assessing how, and about what issues, different student organizations communicated with one another.

---

[4] Center for the Study of Evaluation. Higher Education Measurement and Evaluation KIT. (Los Angeles: UCLA, Higher Education Evaluation Program, Field Edition, 1972).

Carl Peterson: "An Exploratory Analysis of the Development and Achievement of E.O.P. Students," 1970. Peterson noted that one of the most potent variables for predicting achievement was self-esteem.

Gary Cunningham: "A Comparison of Activities and Interests of UCLA Male Athletes and Non-Athletes," 1970. Cunningham used the UCLA data from our national survey to compare the involvement in campus life of athletes vs non-athletes. His results also bear on the need for measuring subcultures in complex university environments.

Charles Lindahl: "Attrition of Administrators in Higher Education," 1971. Lindahl's study was concerned with the frustrations and satisfactions of current and former top-level administrators in the California State Colleges. The data from this study provide a vivid background for developing measures of administrative rewards and frustrations.

Terence Feuerborn: "Organizational Adaptation in Higher Education," 1971. Feuerborn's dissertation was a critical, analytical study of theories and concepts related to organization and institutional responsiveness to change. His conceptualization provides a new theoretical base for viewing institutional adaptiveness and proposed sample items that might be used to measure this aspect of university functioning.

Lora Robinson: "The Assessment of College Student Morale," 1972. Robinson constructed and pre-tested a measure for describing student morale, based on the extent to which students felt that their expectations about college life were realised, and the frequency and intensity of encountering rewarding vs frustrating experiences.

In all cases the existence of these studies is owing in part to the existence of the Higher Education Evaluation Program in the Center for the Study of Evaluation. Their cost to the Center was minimal and in some cases only indirect. Yet each contributed in some way to the development or understanding of important contextual or criterion variables. Among the conditions that make these university-based, low-cost contributions possible are reasonable assurances of long-range funding, a sufficiently broad set of programmatic objectives that include opportunities to explore new pathways, and some tolerant understanding of the fact that the encouragement of scholarly inquiry and the imposition of fixed target dates for its completion are basically incompatible. We would hope that federal policies affecting the role and expectations of Educational Research and Development Centers would always reflect some reasonable degree of openness to this kind of inquiry and exploration.

C. Robert Pace
James W. Trent

UPPERCLASSMEN'S SATISFACTION WITH COLLEGE

Raymond Cook*

In light of current pressures of enrollment, increasing costs, and further expected increases in potential college students, it behooves institutions of higher education to attempt to consider all factors related to completing successfully the requirements for a degree when establishing admissions and retention policies. Student satisfaction is only one of several possible criteria which can be considered in relationship to how well a university or college functions, but it is a criterion to which institutions must continuously respond.

On the college campus there are many observable manifestations that all students are not well satisfied with their college experience. Furthermore, what is satisfying to one student may well be dissatisfying to another. It is generally recognized that students differ and that at any given institution some students will fit better than others, will experience less conflict, and will feel more satisfied with their total experience at that college.

As was shown in the literature review in the dissertation, some research has been conducted which examines student satisfaction, but it has not been done in a manner that takes into account interacting factors. The purpose of this study was to determine the relationship between student satisfaction and variables such as major field of study, type of institution attended, reported progress or benefit derived from the college experience, the college environment, student persistence patterns, residence while in college, involvement in extra-curricular activities, faculty and counselor contact, and selected personality traits. The basis for the study was the hypothesis that there is a best fit among these variables when they are measured in terms of upperclassmen's satisfaction with the college experience.

---

*Ed.D., 1971

Data for the study were obtained from forty institutions in the original Center survey which had an upperclassmen response rate of at least sixty percent. The sample was composed of 4,404 upperclassmen which adequately represented ten major fields of study within the eight types of institutions described in the introduction to this volume.

The population sample came from various types of institutions as follows: general liberal arts colleges, 828; general universities, 818; state colleges and other universities, 566; teachers colleges, 518; selective liberal arts colleges, 530; denominational liberal arts colleges, 422; engineering institutions, 413; selective universities, 281. Respondents were classified according to major field of study as follows: social sciences, 901; education, 628; business, 424; physical sciences, 420; other majors, 414; humanities, 368; biological sciences, 353; engineering, 283; arts, 239; and foreign language, 186.

The satisfaction index from the College Student Survey was used to identify the dependent variable. Satisfaction scores were determined by assigning values to each of four possible responses to the following questions:

1. How well do you like college?

    I am enthusiastic about it - value 4
    I like it - value 3
    I am more or less neutral about it - value 2
    I don't like it - value 1

2. If you could start over again, would you go to the same college you are now attending?

    Yes, definitely - value 4
    Probably yes - value 3
    Probably no - value 2
    No, definitely - value 1

3. Regardless of any vocational benefit college may have for you, do you think that being in college at this time in your life is a very important and beneficial experience?

Definitely yes	- value 4
Generally yes	- value 3
Generally no	- value 2
Definitely no	- value 1

Only those students who responded to at least two of the questions were assigned a satisfaction index score. Therefore the lowest possible score was 2 (1 + 1 + 0), while the highest possible score was 12 (4 + 4 + 4). Twenty-eight of the 4,404 respondents were not included in the investigation as a result of their failure to respond to at least two of the three satisfaction index questions.

Four levels of student satisfaction are arbitrarily designated for the purposes of this investigation:

Highly satisfied	- those students whose responses totaled 12
Generally satisfied	- those students whose responses totaled at least 9 but less than 12
Low satisfaction	- those students whose responses totaled at least 6 but less than 9
Dissatisfied	- those students whose responses totaled less than 6

Independent variables were extracted from other portions of the questionnaire as deemed relevant. Brief operational descriptions of the contents of the separate scales used are given below.

College and University Environment

The college environment section of the College Student Survey was used in its entirety. This section, a condensed version of the College and University Environment Scales (CUES, Pace, 1969b), was used to obtain student perceptions of their campus environment. It consists of five scales or dimensions and each dimension is represented by four statements selected so as to be reasonably reflective of the range of content in each of the five scales, and so as to produce a score that would correlate highly with those obtained on the full length instrument (Pace, Trent, & Morey, 1970). The dimensions include Practicality, Community Awareness, Propriety, and Scholarship.

Educational Benefits

This section of the questionnaire was also used in its entirety. It consisted of 17 items designed to ascertain the respondents' opinion concerning the extent to which their college experience had benefited them or aided them in progress toward attaining a) vocational, b) personal and social, and c) liberal education objectives.

School and College Experience

Several items from this section of the questionnaire were used. First, data were obtained from questions concerning:

1. primary residence while in college
2. major field of study
3. current enrollment in same college as entered as freshman
4. graduate school plans

Also utilized from the section were intervally scaled items concerning:

1. average college grade
2. amount of student-faculty contact
3. amount of student-counselor contact
4. extent of involvement in extracurricular activities

Personal Information

This section of the questionnaire included items designed to determine the age and sex of respondents. Also derived from this section was information concerning the socioeconomic status of the respondent's parents, such as level of education, number of books in the home, and annual income.

Vocabulary

This section was designed to provide information on the word power of college graduates and was utilized in this study to provide some index of the respondent's academic aptitude.

Personal Traits

This section contained opportunities for combinations of responses to the phrases, "I generally like," and "I generally am." When the responses are totaled as keyed, they are designed to provide estimates of three personal traits (autonomy, complexity and theoretical orientation), related to what has been broadly described as intellectual disposition. The three scales have been defined as follows:

Autonomy. This scale, patterned after the concepts of a number of AVL, OPI and OAIS scales, measures nonauthoritarian thinking and a need for independence. These elements are highly correlated with aesthetic and creative inclinations, independence of thinking, flexibility and intellectual quality.

Complexity. This scale measures orientation toward an experimental, inquisitive viewing of experience and tolerance for ambiguities. The scale correlates with the AVL Theoretical and Aesthetic Measures, which distinguish creative individuals, and with the Meyers-Briggs Intuition and Perception Scales, designed to measure a person's tendency to approach his environment with an open, receptive mind.

Theoretical Orientation. This scale assesses the degree of interest in using scientific methods in thinking, including interest in science as such and in scientific activities. High scorers are generally more logical, rational and critical in their approach to problems than those scoring at the average or below (Trent & Medsker, 1968).

Preliminary, chi square and step-wise multiple regression analyses were performed on the data. Results of these analyses are discussed below.

Analyses

Preliminary Analyses

Preliminary analyses included determining the distribution of responses to questions contained in the satisfaction index. Table 1 shows that in response to the question, "How well do you like college?", 29.5 percent were enthusiastic about it, 51.5 percent liked it, 13.9 percent were more or less neutral about it, and 4 percent did not like it. Just over 1 percent of the students did not respond.

As depicted in Table 2, when asked, "If you could start over again, would you go to the same college you are now attending?", 27.4 percent responded "definitely yes," 41.8 percent responded "probably yes," 19.9 percent responded "probably no," while 9.7 percent responded "no, definitely." Again, just over 1 percent did not respond to this question. Table 3 shows that almost 95 percent of the students were in the two "yes" categories when asked if they think that being in college at this time in their lives is "a very important and beneficial experience," with over two-thirds of them being in the "definitely yes" category, evidencing a very high level of general satisfaction with both college choice and the worth of the college experience.

TABLE 1
Respondents' Attitudes Toward the College Experience

Responses	(N)	Percent
I don't like it	(174)	4.0
I am more or less neutral about it	(612)	13.9
I like it	(2,270)	51.5
I am enthusiastic about it	(1,299)	29.5
No response	(49)	1.1

TABLE 2
Respondents' Attitudes toward
Choosing the Same College Again

Responses	(N)	Percent
No, definitely	(426)	9.7
Probably no	(877)	19.9
Probably yes	(1,842)	41.8
Yes, definitely	(1,208)	27.4
No response	(51)	1.2

TABLE 3
Respondents' Attitudes Regarding Whether or Not
College Attendance is Currently Beneficial to Them

Responses	(N)	Percent
Definitely no	(35)	0.8
Generally no	(163)	3.7
Generally yes	(1,205)	27.4
Definitely yes	(2,960)	67.2
No response	(41)	0.9

Table 4 displays the distribution of combined responses to questions contained in the satisfaction index. When the responses are viewed in this form it can be seen that 124, or approximately 3 percent, of the students received a summary score of less than 6, and applying the levels of satisfaction described earlier these students are classified as dissatisfied. An inspection of this table also discloses that 574 (13 percent) may be classified as highly satisfied, 2,734 (63 percent) generally satisfied, while 944 (21 percent) are within the low satisfaction range.

TABLE 4
Distribution of Students' Response to Questions in the Satisfaction Index

Valued Response	(N)	Percent	Cummulative Percent for Each Level of Satisfaction
2	(3)	0.1	Dissatisfied (2.9 percent)
3	(12)	0.3	
4	(25)	0.6	
5	(84)	1.9	
6	(151)	3.4	Low Satisfaction (21.5 percent)
7	(304)	6.9	
8	(489)	11.2	
9	(848)	19.4	Generally Satisfied (62.5 percent)
10	(1,016)	23.4	
11	(870)	19.7	
12	(574)	13.1	Highly Satisfied (13.1 percent)

Chi Square Analyses

Individual variable analyses from which the chi square relationships were gained are not presented in this condensed version of the study, though Table 5 and the following discussion are based upon those analyses. Chi square analyses indicated relationships between student satisfaction scores and twenty of the independent variables when tested at the .001 level of probability. The variables are listed in Table 5 by category according to the magnitude of their chi square scores.

TABLE 5
Chi Square Relationship between Satisfaction Scores
and Independent Variables

Independent Variable	X^2	df	Level of Significance
College and University Environment Scales			
Awareness	276.411	9	.001
Community	268.862	9	.001
Scholarship	207.186	12	.001
Propriety	12.542	9	.184
Practicality	11.619	9	.236
Educational Benefits			
Vocational	274.124	9	.001
Liberal Education	188.495	12	.001
Personal and Social	169.968	9	.001
Average College Grade	173.982	18	.001
Faculty-Staff Contact			
Classroom Contact	150.920	15	.001
Student-Faculty Contact	99.809	18	.001
Student-Counselor Contact	64.976	18	.001
Type of Institution	137.698	21	.001
Intellectual Disposition			
Autonomy	95.157	6	.001
Theoretical Orientation	16.040	9	.066
Complexity	7.483	6	.278
Extracurricular			
Social Service	80.282	6	.001

TABLE 5 (continued)

Independent Variable	X^2	df	Level of Significance
Academic	64.893	9	.001
Creative	36.968	9	.001
Government	17.017	6	.009
Athletic	11.242	6	.081
Primary College Residence	66.549	18	.001
Plan to Attend Graduate School	61.717	3	.001
Sex	29.382	3	.001
Major Fields of Study			
Education	21.040	3	.001
Business	14.293	3	.003
Humanities	12.896	3	.005
Social Science	6.914	3	.074
Engineering	6.153	3	.104
Other	6.414	3	.093
Language	5.164	3	.160
Arts	2.809	3	.422
Biological Science	1.547	3	.671
Physical Science or Math	0.731	3	.866
Age	16.291	9	.061
Same College as Freshman	15.392	3	.001
Socioeconomic Status of Parent	10.605	9	.303
Vocabulary	9.773	9	.370

Although chi square values cannot be compared directly, large differences obtained from the same samples may suggest differences in part. Three of the CUES scales measuring student perceptions of college environmental characteristics showed the highest chi square relationships. Community, the scale measuring student perception of their campus in terms of its being a friendly, cohesive, group oriented campus, had the highest chi square score of all the variables. It was followed among CUES scaled by Awareness. This scale measures student perception of their campus as having an environment which encourages concern about social and political problems, expressiveness through the arts, and tolerance of criticism. Next among the CUES scales was Scholarship, which measures perception of the college as having an environment characterized by intellectuality and scholastic discipline, intellectual achievement, and the pursuit of knowledge. The remaining two CUES scales (Practicality and Propriety) were not found to have a significant relationship with satisfaction scores.

Measures of student-perceived education benefits were found to show the next highest chi square relationship. In this cluster of variables all three measures of educational benefits were shown to have statistically significant relationship with satisfaction scores. Vocational benefits had the highest chi square relationship, followed by measures of benefit to the student in the areas of liberal education and personal and social gains.

The classroom contact scale of the cluster of variables indicating degree of factulty-staff contact with students was next highest in terms of chi square relationship. Within this cluster, student-faculty and student-counselor contact were next in order according to chi square relationships.

Chi square tests between type of institution and satisfaction scores were next in magnitude. Following type of institution was the scale of autonomy in the cluster of variables concerned with intellectual disposition. This scale measures the characteristic composed of nonauthoritarian thinking and a need for independence as reported by the respondent. Measures of complexity (concerned with tolerance of ambiguity, diversity and ambiguity), and theoretical orientation (concerned with measuring interest in using scientific methods in thinking, logic and critical approach to problems) did not show significant relationships with satisfaction scores at the probability level specified.

The cluster of variables measuring involvement in extracurricular activities was next in order of magnitude of chi square scores. First in this cluster was the measure of government, with a chi square of 98.7730, significant at the .001 level of probability. Following, in order of chi square scores, were measures of social service, athletic, academic, and creative activities. Primary college residence, plan to attend graduate school, and sex of the respondent were found to be next in order of size of significant chi square scores.

The major field of education was the only field of study reported to have a significantly positive relationship to satisfaction scores when tested at the .001 level. However, positive relationships were suggested at less stringent probability levels (.005) between business majors and satisfaction scores, as well as humanities majors and satisfaction scores. The final independent variable, in terms of magnitude of chi square score, found to have statistically significant relationship with satisfaction scores was enrollment in the same college the student entered as a freshman. Directions of the relationships and details of the frequency distributions on the satisfaction index for all variables can be found in the original writing on which this report is based.

In an attempt to determine relative strength of relationship between independent variables and the dependent variable, correlation coefficients were computed for all independent variables composed of measures with interval scales. The results of the computations were such that little value could be derived in terms of strength of relationships.

This situation emphasized the necessity of subjecting the full set of independent variables to additional statistical treatment in order to consider the major hypothesis of this study. A statistical treatment to determine the proportion of variation in the dependent variable that is explained by a set of independent variables is indicated.

Step-Wise Multiple Regression

Step-wise multiple regression was selected as an additional appropriate treatment of the data in order to determine the predictive value of independent variables in terms of difference in student satisfaction with college. The results of these analyses are summarized in Table 6. This table presents information for each independent variable at the conclusion of the final step. In this instance the final step was determined by the last variable entered that was found to be statistically significant at the .10 level as determined by the F test.

Awareness was shown to be the independent variable explaining the most change (accounting for the greatest variation) in the dependent variable. Awareness was followed, in order of percent of change explained in the dependent variable, by educational benefits, community, average college grade, and autonomy.

Other independent variables explaining a lesser degree of difference in the dependent variable were found to be engineering institutions, scholarship, general universities, contact with college personnel, theoretical orientation,

TABLE 6
Multiple Regression Analysis of Independent Variable Influence on Student Satisfaction Scores

Item	Multiple R	R Square	R^2 Change	Simple R	B	Beta
Awareness	.228	.083	.083	.288	.068	.148
Educational Benefits	.381	.145	.062	.287	.034	.191
Community	.419	.175	.031	.261	.089	.174
Average College Grade	.447	.199	.024	.197	.077	.152
Autonomy	.459	.211	.011	-.148	-.026	-.095
Engr. Institutions	.469	.220	.009	-.135	-.232	-.117
Scholarship	.477	.228	.008	.228	.050	.119
General Universities	.481	.231	.004	.057	.042	.028
Humanities	.484	.234	.003	-.057	-.104	-.051
Contact	.487	.237	.003	.185	.011	.066
Theoretical Orientation	.490	.241	.003	.043	-.010	-.063
Frat./Sorority	.494	.244	.003	.053	.107	.050
Gen. Liberal Arts	.495	.245	.002	-.037	-.117	-.079
Select. Liberal Arts	.497	.247	.002	.031	-.114	-.080
Extracurricular	.501	.251	.001	.120	.015	.037
Propriety	.502	.252	.001	-.014	-.020	-.036
Rooming House	.503	.253	.001	-.030	-.195	-.034
Denom. Liberal Arts	.504	.254	.001	-.003	-.063	-.032
Education	.505	.255	.001	.070	.047	.029

Notes: Multiple R represents the zero-order correlation between the actual values obtained for the dependent variable and those values predicted from the least-squares equation.

R Square represents the proportion of the variance in the dependent variable accounted for by the regression equation.

R Square Change indicates the change in R Square from the value of R Square at the previous step.

Simple R represents the correlation between the independent variable and the dependent variable.

B and Beta represent the values of the regular and normalized regression coefficients respectively.

residence in fraternity or sorority, general liberal arts colleges, selective liberal arts colleges, involvement in extracurricular activities, propriety, living in a rooming house, denominational liberal arts colleges, and an education major.

As shown in Table 6, awareness was the source of approximately 8.3 percent of the difference in student satisfaction index scores. This independent variable is followed in percent of influence upon the dependent variable by student perceived benefit from the college experience. This variable was responsible for approximately 6.2 percent of the difference. These two variables together then accounted for approximately 14.5 percent of the difference in the dependent variable as determined by step-wise multiple regression analysis.

Community, the second environmental measures variable, was the next highest change influence on the dependent variable (3.1 percent). Average grade while in college followed with 2.4 percent. The last independent variable explaining more than one percent of the difference in the dependent variable is autonomy. When considered together, these five independent variables (awareness, educational benefits, community, grade point average, and autonomy) account for approximately 21 percent of the difference in the dependent variable.

Several independent variables shown in Table 6 have higher normalized regression coefficients than awareness. This is an indication that when considered individually, they have stronger relationships with the dependent variable than awareness. However, their predictive value in terms of probable influence in the dependent variable is somewhat less than that of awareness. Because in the multiple regression there is an attempt to predict the criterion, the same kinds of relationships are not expected as were observed in the chi square relationships.

Table 6 also discloses that each of the CUES scales analyzed by step-wise multiple regression had measurable influence upon the dependent variable within the criterion limits of this study. This finding shows that there is a widely used instrument that may provide some indication of student satisfaction with their college experience.

The negative Beta scores displayed for autonomy, certain institutional classifications, some major fields of study, and kinds of residences while in college indicate the probability of inverse relationships between certain independent variables and the dependent variable, such as general, denominational and selective liberal arts colleges, engineering institutions, humanities major, and residing in a rooming house.

In summary, it appears that the application of step-wise multiple regression analysis did not result in the discovery of strong predictive values for the independent variables treated. However, this treatment did reveal that awareness had the greatest predictive value in terms of explaining difference in the dependent variable, student satisfaction with college, and that five independent variables collectively were found to account for approximately 21 percent of the change in the dependent variable. Nineteen of the 38 variables treated entered into the regression equation. Ten of those independent variables were shown to have a positive relationship to the differences in the dependent variable, while 9 were shown to have a negative influence.

A number of the variables showed potential usefulness for predicting satisfaction with college, but when all significant variables were entered into the equation, only 25.5 percent of the variance was accounted for. Therefore, it appears that it is not possible to predict student satisfaction with college sufficiently with these kinds of variables, at least not without further refinement and elaboration.

Summary and Recommendations

The findings of this study did not reveal sufficiently conclusive evidence to support the hypothesis that there is a best fit among students' major field of study, type of institution, personal characteristics, the college environment, involvement in extra-curricular activities, and perceived benefit from the college experience when measured in terms of satisfaction with the college experience.

Support for the hypothesis, however, was indicated by certain of the findings. Chi square analysis showed a statistically significant relationship between student satisfaction and 19 independent variables. Significant relationships between student satisfaction and the Community, Scholarship, and Awareness Scales of the College and University Environment Scales were found. In addition, type of institution, primary college residence, average college grade, sex of respondent, and autonomy were found to have statistically significant relationships with satisfaction scores. Indications of relationships were also discovered between satisfaction with college and educational benefits, involvement in extracurricular activities, plans to attend graduate school, and student-counselor and student-faculty contact.

Correlation coefficients disclosed a slight positive relationship between the dependent variable and several intervally scaled independent variables. Measures of autonomy and complexity were found to have negative relationships with college satisfaction scores.

Step-wise multiple regression applied to all independent variables did not reveal strong values for explaining differences in the dependent variable. However, the regression analysis did indicate the five strongest variables: awareness, perceived benefit from the college experience, community, average college grade, and autonomy. These five variables accounted for 21 percent of the difference in scores of student satisfaction with the college experience.

A number of variables identified in previous studies as being influential in terms of student satisfaction with college were found to have only a nominal effect upon student satisfaction in this study. Most students, regardless of the type of institution they were attending or their major field of study, were generally satisfied with their college experience (62.5 percent). However, more students reported low satisfaction (21.5 percent) than reported high satisfaction (13.1 percent) and 2.9 percent of the more than 4,000 students reported that they were dissatisfied with college.

Although statistical treatment of the variables investigated did not sufficiently support the hypothesis that there is a best fit among the independent variables investigated when measured in terms of student satisfaction with the college experience, several implications may be drawn from the findings of this study.

Apparently a number of variables previously identified as being influential in terms of student satisfaction with college have only a nominal effect upon student satisfaction. The often expressed opinion that the large impersonal institutions are a major source of dissatisfied students is not supported by the findings of this study. In fact, there is some support for identifying institutions classified as engineering and general liberal arts colleges as those having disporportionately high percentages of dissatisfied students enrolled.

Residence while attending college has been identified by some researchers as being a determinant of satisfaction, particularly among those students who live at home. The only element in this study which related this contention suggested that residing in rooming houses rather than at the student's home may have a negative influence on student satisfaction.

No real value was discovered in terms of student satisfaction for the encouragement often given for participation in extracurricular activities. It appears from the evidence discovered here that faculty as well as student time and energy directed toward increasing student involvement in extracurricular activities of academic and non-academic nature might be better spent improving student perceptions of the qualities of the college environment associated with a friendly, cohesive, group-oriented atmosphere.

Evidence concerning the influence of the atmosphere often attributed to selective liberal arts colleges casts serious doubt on the ability of such atmosphere to exert either a positive or negative effect upon the student in terms of satisfaction with the college experience. In addition, identification of some majors often associated with a "liberal arts" education as containing disproportionate numbers of dissatisfied students was not supported by this investigation. In fact, both the type of institution and the major field of study found to have the strongest negative relationship with satisfaction of the student was engineering. Majoring in the arts was found to have no significant relationship to satisfaction level and majors in the humanities were found to have little difference in level of satisfaction when compared to all other majors. However, it should be noted that this conclusion is based upon a very high level of significance, that is, .001. Humanities and business did exceed the .01 level of probability.

When the population was considered by type of institution, marked differences were found. Forty percent of the dissatisfied females were attending general liberal arts colleges. This type of institution, combined with selective liberal arts colleges and teachers colleges, accounted for 75 percent of all the dissatisfied females.

Among the dissatisfied males, the highest percentage was found to be in engineering type institutions. Together with general universities, these types of colleges accounted for 50 percent of all of the dissatisfied males.

It appears that male engineering majors in institutions other than selective universities and selective liberal arts colleges are likely to have less satisfying college experiences than students in any other major in those institutions. Engineering majors in engineering institutions also report a mean satisfaction score below that of engineering majors in selective and general universities.

Contradicting a common assumption that students today are very critical of the education they are receiving in college, Trent (1970a) concluded on the basis of his research that though there is a growing minority of students who are dissatisfied with their college education, the great majority are generally satisfied. This conclusion was verified in this study, where little variation in percentages of students at various levels of satisfaction was discovered when comparing the present findings with those of studies conducted earlier by Freedman (1961), Weiss (1964), Panos and Astin (1967), and Feldman and Newcomb (1969).

On the basis of the present data, most students--regardless of the type of institution, major field of study, personal contact with college personnel, or intellectual disposition--are generally satisfied with their college experiences. A larger percent of students are generally satisfied than are highly satisfied or dissatisfied. More students report low satisfaction than report high satisfaction. A very small percentage of students are dissatisfied with their college experience.

Serious questions should be raised about extensive efforts to make major changes in the environment of institutions or change the student-institution match with an expressed intent of improving the student satisfaction with college without further investigation. Still, the students of today may be asking for things other than satisfaction with their college and the results of this study should not be construed to constitute a rationale for disregarding concerns regarded to be relevant by students.

As this study progressed, an underlying concern developed that the design fails to consider adequately the interactions that are likely to exist among various combinations of variables which, when considered individually, are found to have little or no real influence upon student satisfaction with college. Additional efforts should be made to make sure that measurements used are appropriate measurements. This study was dependent upon secondary analyses using scales developed by others who have indicated a need for further refinement of the measures to assure more reliability and validity. It could be that once greater reliability and validity is attained for those measures, they may be more predictive than the present investigation revealed.

There is also some question as to whether the statistical treatments applied in this study were sufficiently able to take into account the interactions that may exist between certain of the independent variables when their relationships to student satisfaction were investigated. Although the findings revealed statistically significant effects of few independent variables upon differences in student satisfaction with college, there were indications that additional independent variables or combination of variables not identified here could affect student satisfaction, and that other types of analyses might reveal the existence of interactions between certain variables which could account for the differences found on student satisfaction scores.

Further research focusing on the following avenues of inquiry is therefore recommended as follows:

1. a replication of this study employing a larger number of independent variables that may individually or collectively influence student satisfaction with the college experience;

2. application of statistical treatment such as described by Sonquist and Morgan (1964), which is designed to detect the interaction effects between independent variables as they are added to a predictive equation;

3. longitudinal studies to explore changes in satisfaction during and after college;

4. interaction effects of sex, major field of study, intellectual disposition, CUES scores, and type of institution in predictive equations concerning student satisfaction with the college experience; and

5. the development of strategies for discovering more effective predictors of student satisfaction with their college experience.

CORRELATES OF GRADUATE DEGREE ASPIRATIONS

Margaret Ann New*

Introduction

For many students, particularly those whose parents are college-educated, going to college is a natural extension if not the normal expection of their preparation for adult life (Remmers & Radler, 1957). Parental values are generally passed along to offspring (Havinghurst & Breese, 1947); the aspiration for a college diploma is no exception (Trent, 1970b). It is known that experiences encountered at college are also a significant influence on educational goals (Pace, 1967; Thistlethwaite, 1965). The relative importance of family versus college experience, however, is not clear and most probably varies considerably from one individual to another (Astin, 1965).

The purpose of this study was to assess the relative influence of pre-college background and inputs from the college experience and environment on student aspirations to pursue and attain advanced academic or professional degrees. To do this, the study determined the correlation between stated aspiration and (1) pre-college influences; (2) the college experience as reflected in student interests, attitudes, activities and involvements during the undergraduate years; and (3) the scholastic demands of the college or university attended as perceived by the student. Included in pre-college influences were such variables as family socioeconomic status, father's occupation, parental education, cosmopolitanism, high school activities, and past academic performance. Many of these variables were combined to form a broad composite indicator termed the Cultural Sophistication Index (CSI).

---

*Ed.D., 1972.

A CSI score was determined for each student according to a weighted cumulation of positive responses to the nine multiple-choice items included in the Socioeconomic Status of Parents and the Cosmopolitan Index scores. The Cosmopolitan Index contains four items:

1. level of urban development where student lived as youth
2. level of urban development where student now lives
3. area of country where student has lived
4. total length of time spent in foreign countries.

The Socioeconomic Status of Parents score contains five items:

1. highest educational level of father
2. highest educational level of mother
3. number of books in the home
4. annual income of family
5. father's major occupation.

The sample chosen for use in this study included those respondents attending thirteen of the colleges and universities from the original Center data bank. The 3,127 freshmen and upperclassmen usable questionnaires in the current sample came from five institutional types: selective liberal arts colleges, denominational liberal arts colleges, teachers colleges, engineering schools, and select universities. Previous research has suggested that these five particular categories would be suitably diverse in the academic orientation of their students (Pace, 1964, 1967; Astin, 1965). Table 1 groups the thirteen schools by category, shows the number of students in each institutional sample, and records for each school the completed questionnaire response rate.

Two criteria were used to select the best possible three schools for each of the first four categories: (1) evidence that truly random or representative

TABLE 1
Colleges and Universities Selected for the Study

School	Freshmen		Upperclassmen	
	Sample size	Response rate	Sample size	Response rate
Engineering Schools				
South Dakota School of Mines and Technology	138	92.0	99	99.0
Rensselaer Polytechnic Institute	151	50.0	105	49.5
Virginia Polytechnic Institute	197	85.4	74	99.0
Teachers College				
Delta State Teachers College	76	76.0	70	63.6
University of Northern Iowa	147	100.0	123	63.0
Montclair State College	274	91.3	140	71.0
Select Liberal Arts Institutions				
Beloit College	132	90.7	88	82.7
Macalester College	103	71.0	95	73.0
Carleton College	123	82.0	73	66.7
Denominational Liberal Arts Institutions				
La Salle College	161	86.0	99	100.0
Goshen College	117	74.5	94	72.6
Susquehanna University	114	76.0	96	87.2
Select University				
University of California, Los Angeles	215	72.8	143	65.9
Total sample	1,948		1,299	

sampling was used, and (2) high rates of return from both freshmen and upperclassmen. A 50 percent return was the minimum acceptable, but schools in this sample generally reported more than a 70 percent return. An additional school, the University of California, Los Angeles, was added specifically to explore the dimension of the "select university" category.

Each student was classified at one of three levels of academic degree aspiration: High, Medium or Low. This was done in order to evaluate the relative effect on his aspiration of the three areas of influence mentioned above. The level of academic aspiration was measured by student self-reported plans for graduate school, level of academic degree sought, and the degree of certainty of these plans. The three levels were established as follows:

High Aspiration. The student indicates that he plans to enroll in graduate school after completing college and to seek either an advanced professional degree (law, medicine, or other) or a doctorate. He is "fairly sure" or "very sure" of these plans.

Medium Aspiration. The student says that he plans to enroll in graduate school after completing college to obtain a master's degree, plans to complete some graduate work, or appears to have only potential interest in a doctorate or advanced professional degree (any respondent with "unsure" plans for a doctorate or advanced professional degree was placed in this category.) He is "fairly sure" or "very sure" of these plans. The student planning on graduate school with some uncertainty was also included in this category.

Low Aspiration. The student indicates that he does not plan to enroll in graduate school after completing college. Regarding these plans, he can be "unsure," "fairly sure," or "very sure."

The specific research hypotheses tested in this study are stated below as null hypotheses:

H_1 There is no significant correlation between level of academic aspiration and level of cultural sophistication.

H_2 There is no significant difference between upperclassmen and freshmen on level of cultural sophistication and level of academic aspiration.

H_3 There is no significant difference between freshmen and upperclassmen after controlling for additional pre-college influences between High aspiration and college scholarship environment.

H_4 Among female college students, there is no significant correlation between level of academic aspiration and their mother's level of education.

H_5 There are no significant predictors of academic aspiration.

H_6 There is no significant difference in measure of college experiences and perceptions among upperclassmen with the High level of academic aspiration and upperclassmen with Medium or Low levels of academic aspiration.

H_7 There is no significant difference in measure of college experiences and perceptions among freshmen with the High level of academic aspiration and freshmen with Medium or Low levels of academic aspiration.

H_8 There is no significant difference between male and female upperclassmen in the High academic aspiration level.

H_9 There are no significant differences between institutions on degree of aspiration for freshmen and upperclassmen.

Analyses

This section will first report the distribution of low, medium, and high academic aspiration levels within the sample, broken down by class and sex, and then the same categorical distribution of cultural sophistication levels, broken down by class. Following those discussions, the nine hypotheses will be considered. Reported here, in most instances, are only the conclusions drawn from the evidence shown in analyses and tables in the original report of the study and whether or not they confirmed the author's hypotheses. Once again, the more interested reader is urged to pursue any questions or special interests by referring to the dissertation in its complete form.

Academic Aspiration

All students in the current sample were judged on their level of academic aspiration, using the three-level classification procedure outlined in the introduction. Table 2 displays the distribution by class and sex.

The proportion of males aspiring to some form of graduate education (medium or high categories) remained relatively fixed (freshmen 69.9 percent, upperclassmen 68.7 percent), although within this category there appeared to be less interest in doctoral degrees among upperclassmen (28.2 percent) than among freshmen (32.9 percent). On the other hand, the difference in the proportion of females interested in graduate work (including high and medium aspiration levels) was reversed--upperclassmen (54.9 percent) and freshmen (47.5 percent). The females showed less interest in doctoral degrees when upperclassmen (8.8 percent) than when freshmen (11.0 percent), but this small difference could be considered to be more than offset by the marked increase in interest in the master's degree (freshmen 36.5 percent, upperclassmen 46.1 percent).

TABLE 2
Academic Degree Aspirations for Freshmen and Upperclassmen by Sex

Sex and Level of Aspiration	Freshmen			Upperclassmen		
	(N)	%		(N)	%	
Males						
Baccalaureate degree	(317)	30.1		(237)	31.3	
Master's degree	(390)	37.0	69.9	(307)	40.5	68.7
Doctorate or advanced professional degree	(347)	32.9		(214)	28.2	
Total	(1054)	100.0		(758)	100.0	
Females						
Baccalaureate degree	(451)	52.4		(241)	45.1	
Master's degree	(314)	36.5	47.5	(246)	46.1	54.9
Doctorate or advanced professional degree	(95)	11.0		(47)	8.8	
Total	(860)	100.0		(534)	100.0	

The difference in graduate degree aspiration found cross-sectionally between the two class levels of women contrasted significantly with the relatively similar male aspirations. It could be inferred from these cross-sectional differences that college makes a greater impact on women's academic aspirations than on those of men. One could also infer that for both sexes the overall effect of college in this area is to decrease aspiration for the most advanced degrees (doctoral or higher professional degrees); 23 percent of the freshmen aspired to this level, compared with 20.2 percent of the upperclassmen. The difference between the two groups concerning enthusiasm for very advanced education, along with significantly higher aspiration levels of upperclassman women, seems to account for the increased percentage of upperclassman women having an interest in middle-level degrees.

An interesting inference which can be drawn from these data, however, is that women aspiring for the highest academic degrees suffered the severest "attrition" of all. Fewest to begin with (comprising only 11 percent of freshman women), they accounted for a mere 8.8 percent of upperclassman women, compared to the 28 percent of upperclassman men at this level. Astin (1969), in her study of women obtaining doctorates in 1958, found that females were more likely to finish graduate programs than males. Thus, it seems, the difficulty lies more in getting women initially motivated toward attainment of advanced degrees than in keeping them in programs once they are admitted.

Cultural Sophistication Index

CSI scores were calculated for the 1,948 freshmen and 1,299 upperclassmen responding to the survey from the 13 colleges and universities selected. Scores ranged from 0 to 41 and were based on the indicators pointed out earlier. When the scores were plotted separately for freshmen and upperclassmen, both distributions were on nearly identical normal curves with a very slight skew toward lower scores. The similarity in distribution of scores for the two classes is reflected in Table 3.

The students were separated into three groups (high, medium, and low cultural sophistication) by dividing the range of scores into three approximately equal segments: (0-14), (15-28), and (29-41). Scores of 26.5 and 13 lie roughly one standard deviation above and below the mean respectively. The dividing lines between CSI categories (14 and 28) fall somewhat higher. The aforementioned distributional skew, coupled with this slight upward displacement of dividing lines, causes about twice as many students to fall in the low category as in the high. The relative distribution of these scores can be seen in Table 4.

TABLE 3
Distribution of Scores on the
Cultural Sophistication Index

Type of Score	Freshmen (N = 1,948)	Upperclassmen (N = 1,317)
Maximum Score	40	41
Minimum Score	0	0
Median	19	19
Mean	19.8	19.7
Standard Deviation	6.7	6.7

TABLE 4
Class Distribution of Scores on the
Cultural Sophistication Index

Class	Low	Medium	High
Freshmen	23.2%	66.2%	10.6%
Upperclassmen	24.4%	65.2%	10.4%

This disproportion enhances the weight of a high CSI score and lowers the weight of a borderline score, thereby emphasizing the importance of high cultural sophistication in the following analyses.

Level of Academic Aspiration by Level of Cultural Sophistication

The first research hypothesis (H_1) suggested that no significant correlation would be found between level of academic aspiration and level of cultural sophistication. The degree of correlation between the two rank-ordered variables was tested by computing Kendall's τ and finding the corresponding level of statistical significance. The results of these tests are shown in tabular form in the original writing, but are here summarized in Table 5.

TABLE 5
Correlation Between Level of Academic Aspiration and Level of Cultural Sophistication

Class	Males	Females
Freshmen	$\tau = 0.19$; $p<.0001$	$\tau = 0.13$; $p<.0001$
Upperclassmen	$\tau = 0.11$; $p<.0001$	$\tau = 0.05$; $p<.05$

With the exception of upperclassman females, a tentative conclusion with regard to this data is that a positive correlation exists between the level of cultural sophistication and the level of academic aspiration. Although the relationships were not observably great, with the exception of the upperclassmen females they were highly significant statistically, even when granting the large numbers involved.

The failure of upperclassman women to exhibit this correlation, particularly when the younger freshman women did, may deserve consideration. A partial explanation may lie in the similar, if smaller, reduction in correlation shown by males between the freshman and upperclassman years. This would suggest that the college experience per se may affect the correlation.

The following conclusions were reached based on the analysis of the relationship between level of CSI and Degree Aspiration summarized in Table 5:

1. There is a higher correlation for males than for females.
2. The correlation is higher for freshmen than for upperclassmen.
3. Women have lower aspirations than men, regardless of class or level of cultural sophistication.

4. Greater differences in aspiration between freshman and upperclassman man years occur for women than for men.
5. Regardless of sex, class, or average level of aspiration, the proportion of aspirants toward high academic degrees increases with an increasing level of cultural sophistication.

From these results, hypothesis one is rejected. A modest positive correlation does exist between level of academic aspiration and level of cultural sophistication.

Upperclassmen and Freshmen: Level of Degree Aspiration by Level of Cultural Sophistication

Hypothesis two (H_2) suggests taking the results of hypothesis one a step further to look at differences between upperclassmen and freshmen. It states that no significant difference exists between upperclassmen and freshmen on level of academic aspiration by level of cultural sophistication.

It was not surprising to find CSI to be positively correlated with academic aspiration, but the difference additional years of college make on the degree of correlation between the two classes is what merits attention here, as the degree of significance of that finding is tested directly.

The initial step in this procedure was to find the correlation between CSI and academic aspiration by class without regard to sex. These data confirmed expectations: for freshmen, Kandall's τ was 0.16, and for upperclassmen it was 0.08, both significant at the $p>.0001$ level. The second step was to determine if these mean values of τ were in fact from different sample populations or whether they represented the same sample population but differed by chance. This calculation revealed that the τ's found indeed represented different populations, at a .001 level of significance.

Conclusions drawn from these analyses are as follows:

1. the freshmen's relationship between CSI and degree aspiration is significantly greater than that of the upperclassmen

2. the relationship between level of degree aspiration and level of cultural sophistication is different between freshmen and upperclassmen

3. indications are that additional years in college have a negative effect on the relationship

Therefore, hypothesis two is rejected. The evidence presented confirms that a difference does exist between upperclassmen and freshmen on a correlation between level of academic aspiration and level of cultural sophistication.

Upperclassmen and Freshmen: High Degree Aspiration by College Scholarship Environment

Hypothesis three (H_3) introduced another dimension of the study--college scholarship environment. This hypothesis states that, after controlling for additional pre-college influences, there will be no significantly higher correlation between high degree aspiration and the college scholarship environment among upperclassmen than among freshmen.

It was anticipated that students' perceptions of the college environment as a scholarly institution would influence the scholarly pursuits of the students themselves. It was also expected that a number of other environmental and student variables would be related to educational aspiration. In addition, the possibility existed that these variables would also be related to students' perceptions of the environment. Consequently, multiple-regression analysis was undertaken to determine if the students' perception of the scholarliness of their environment would be related to post-graduate educational aspiration in a way not accounted for by other variables.

Twenty-four variables chosen for their potential relevance in this context on the basis of previous research discussed in the original writing are used in this analysis, including CSI and college scholarship environment. The dependent variable is high degree aspiration. Tables 6 and 7 list the 24 variables in the order they were added to the cumulative regression equation. An explanation of each column in these two regression tables is given below.

Multiple R represents the zero-order correlation between the actual values obtained for high degree aspiration (dependent variable) and those values predicted from the least-squares equation.

R Square represents the proportion of the variance in the reported high-aspiration level accounted for by the regression equation.

R Square Change indicates the change in R Square from its previous value achieved by adding one new variable.

Simple R represents the correlation coefficient between high-aspiration level and that particular independent variable.

B represents the slopes of the regression coefficients.

Beta represents the standardized regression coefficients or the adjusted partial slopes.

The data in Tables 6 and 7 indicate that few variables, using Beta weights, were significantly correlated with high degree aspiration even at the .10 level as determined by the F test. Furthermore, the college scholarship environment did not appear significant on either the freshman or the upperclassman lists. While it was not the least correlated of the variables (three items are less positively correlated for the freshmen; four for the upperclassmen), apparently this aspect of the college environment played a small role in the determination of academic aspiration as measured.

The variables in Table 6 for upperclassmen that are significantly correlated with high degree aspiration are the respondent's sex (Beta .318) and high school grade point average (Beta .175). Appearing in Table 7 as significant correlates of high degree aspiration for freshmen are the respondent's sex (Beta .329), Protestant affiliation (Beta .121), the time the respondent decided to attend college (Beta .107), the Cultural Sophistication Index (Beta .106), and high school grade point average (Beta .102). The failure of the Cultural Sophisitcation Index particularly with reference to upperclassmen, to be a prominent factor in predicting high degree aspiration through multiple regression heightens concern over the relationship between the Cultural Sophistication Index and degree aspiration.

TABLE 6

Upperclassmen Multiple-Regression Analysis of Independent Variable Influence on High Degree Aspiration

Item (variable)	Multiple R	R^2	R^2 Change	Simple R	B	Beta
Cultural Sophistication Index	.146	.021	.021	.147	.009	.080
Time decided to go to college	.154	.024	.003	.084	.009	.014
How many friends go to college	.157	.025	.001	.068	-.001	-.001
High school GPA	.205	.042	.018	.154	.113	.175
Respondent's age	.205	.042	.000	-.020	.014	.009
Respondent's sex	.329	.109	.066	.222	.476	.318
Respondent's marital status	.330	.109	.001	.041	.066	.026
Respondent's political identification	.338	.114	.005	.087	.024	.022
Parents' political identification	.339	.115	.001	.053	.011	.013
Total high school activities	.343	.118	.003	.060	.027	.069
Respondent's race	.345	.119	.001	.039	.190	.037
Catholic	.347	.120	.001	.029	.142	.080
Jewish	.349	.122	.002	.065	.181	.052
Protestant	.356	.127	.005	.099	.091	.055
Major - Biology	.373	.139	.012	.124	.232	.092
- Social science	.380	.144	.006	.073	.113	.051
- Languages	.381	.145	.000	-.079	-.106	-.031
- Humanities	.397	.157	.013	.091	.254	.087
- Art	.398	.159	.001	-.012	.039	.011
- Engineering	.414	.171	.013	-.059	-.331	-.158
- Business	.421	.177	.006	-.106	-.265	-.093
- Education	.422	.178	.000	-.111	-.050	-.020
- Other major	.422	.178	.000	-.049	-.019	-.009
College Scholarship Environment	.422	.178	.000	.014	.009	.019

TABLE 7
Freshmen Multiple-Regression Analysis of Independent Variable Influence on High Degree Aspiration

Item (variable)	Multiple R	R^2	R^2 Change	Simple R	B	Beta
Cultural Sophistication	.196	.038	.038	.196	.196	.106
Time decided to attend college	.245	.059	.022	.183	.079	.107
How many friends go to college	.249	.062	.002	.134	.020	.021
High school GPA	.263	.069	.007	.146	.073	.102
Respondent's age	.267	.071	.002	-.042	.171	.036
Respondent's sex	.404	.163	.092	.283	.514	.329
Respondent's marital status	.405	.164	.000	.020	-.203	-.033
Respondent's political identification	.409	.167	.004	.050	.030	.026
Parents' political identification	.410	.168	.000	.042	-.006	-.007
Total high school activities	.416	.173	.005	.062	.039	.093
Respondent's race	.420	.177	.003	-.034	-.156	-.046
Catholic	.421	.177	.000	.008	.126	.072
Jewish	.424	.180	.003	.098	.288	.079
Protestant	.439	.193	.013	.128	.220	.121
Major - Biology	.463	.214	.022	.191	.229	.081
- Social science	.470	.221	.007	.080	-.036	-.017
- Language	.470	.221	.000	-.048	-.164	-.049
- Humanities	.470	.221	.000	-.014	-.195	-.060
- Art	.471	.221	.000	-.052	-.256	-.074
- Engineering	.471	.222	.001	.035	-.283	-.119
- Business	.482	.233	.011	-.137	-.468	-.168
- Education	.484	.234	.001	-.138	-.249	-.091
- Other major	.490	.240	.006	-.066	-.225	-.108
College Scholarship Environment	.493	.243	.003	.045	.038	.054

These results lead to the following conclusions:

1. The college scholarship environment is not a significant correlate of high degree aspiration for upperclassmen or freshmen.
2. The respondent's sex has the highest correlation for both freshmen and upperclassmen.
3. High school grade point average has a relatively high correlation for both freshmen and upperclassmen.
4. Cultural sophistication is not a prominent correlate of high degree aspiration.

Null hypothesis three, as stated, must therefore be accepted. Upperclassmen do not show a higher correlation between the college scholarship environment and high degree aspiration than do freshmen. Indeed, the perceived scholarliness of the environment, as measured, seems to have no bearing whatsoever on post-graduate educational aspiration.

Upperclassman and Freshman Females: Level of Degree Aspiration by Level of Mother's Education

Of particular interest in this study was the influence of the mother on her college-age daughter. The fourth hypothesis (H_4) raises the question of whether there is a significant relationship between female college students' level of degree aspiration and their mothers' level of education.

Previous investigators have found that the fathers' level of education and occupation are important positive determinants of students' educational and occupational aspirations (Astin, 1964; Iffert, 1957). It is not clear to what extent the father acts directly as a role model or how much his success enhances indirectly the cultural milieu of his offspring. Fathers' level of education, however, is an important indicator in the CSI used in this study; therefore, separate attention to mothers' education seems appropriate.

It was found that only one out of eighteen mothers sending their daughters to college had themselves gone beyond the baccalaureate level. For both freshman and upperclassman women, there was a small but significant correlation between maternal education and daughter's academic aspiration (freshmen: $\tau = 0.10$, $p<.0001$; upperclassmen: $\tau = 0.07$, $p<.005$), results that again showed a smaller correlation for upperclassmen than freshman women.

In general, a greater proportion of daughters (freshmen, 11.0 percent; upperclassmen, 8.8 percent) sought advanced degrees than the percentage of their mothers who had some graduate training (5.6 percent and 5.7 percent respectively for the two class levels of daughters). However, when only the daughters of mothers actually holding an advanced degree were looked at separately, their percentage of high degree aspirants was much higher than the total group (freshmen 22.4 percent; upperclassmen 16.7 percent).

The conclusions drawn from these data and other analyses performed in the dissertation are as follows:

1. There is a significant, but modest, positive correlation between mothers' education and daughters' level of aspiration.
2. The correlation is stronger for freshmen than for upperclassmen.
3. One out of 18 mothers whose daughters are in college has received graduate training or a degree.
4. More freshman and upperclassman females aspire to higher academic achievements than were reached by their mothers.
5. The probability of high academic aspiration increases for females with mothers having graduate training.

Hypothesis four is rejected on the above evidence that indicates that a modest positive correlation does exist between females' level of academic aspiration and mothers' education.

Upperclassmen and Freshmen: Significant Predictors of Degree Aspiration

The fifth hypothesis (H_5) states that there are no significant predictors of high degree aspiration. To look at the predictive power of numerous selected variables, a step-wise multiple-regression analysis was employed, similar to the one used to test hypothesis three. In this analysis, however, the technique was modified to permit a more flexible regression, allowing the computer to select the order of importance instead of using the previous fixed order. Operationally, this means choosing variables with the largest R Square Change.

Many variables, both those previously tested in this study and some still to be tested, were included in the analysis. The 24 variables previously seen in hypothesis three are again used in testing hypothesis five.

The six tables dealing with this hypothesis in the dissertation included multiple regression analysis for all freshman, male freshmen, female freshmen, all upperclassmen, male upperclassmen, and female upperclassmen. The necessity for a sex breakdown was evidenced by the fact that respondent's sex was the single most important determinant of high academic aspiration for both freshmen and upperclassmen.

With the sex factor thus removed, high school grade point average was found to be the most important determining variable for all but freshman women. One implication from this finding is that academic success seems to breed academic ambition. Biology major and cultural sophistication also appeared as important variables on all but one table; though biology major also was among those considered very significant for upperclassmen women, cultural sophistication did not have a high enough significance to even be included in the table. Biology's common association with pre-medical majors may be a cause of its high ranking, because it may attract a disproportionate percentage of students with high academic aspirations.

The failure of cultural sophistication to be included on the upperclassman female list was not entirely unexpected in light of the earlier finding that cultural sophistication did not show a very high correlation with academic aspiration for this group. Humanities major did appear high on this list, however, and does not appear for any of the three other sex and class level differentiated groups. This finding has unclear implications as one would expect an interest in humanities to be related to high cultural sophistication. No satisfactory explanation can be offered in this study for the isolated appearance of this major and the concurrent disappearance of cultural sophistication for upperclassman women only.

The tables concerning freshmen and upperclassmen males reveal some characteristics having negative correlation with aspiration for advanced academic degrees--specifically, being in the fields of engineering, business or education. A common denomenator among these three majors is that each offers a professional start in its respective field without requiring further training beyond the baccalaureate level. A career in any of these three fields may be enhanced by graduate schooling, but it is not required as a minimum credential for career entrance. Thus, for many students with little motivation or opportunity to pursue graduate studies, these three fields may be very attractive, as they can suspend their education at the bachelor's level without great occupational hindrance.

Biology and social science majors appear on the multiple regression tables for both upperclassman and freshman females and have a positive correlation with aspiration. With the exception of a biology major for freshman males, neither of these majors is included among significant correlates (or overcomes the negatively correlated majors previously mentioned) for males.

High school activities appear to be correlated with aspiration for freshman males and females, and even more strongly for upperclassman women. Many more variables are seen as significantly correlated with aspiration for freshmen than for upperclassmen. Among the variables found to be unique to freshmen are the following: the time the student decided to attend college, Jewish affiliation, Protestant affiliation, the respondent's age, and his parents' political identification.

Hypothesis five stated that there are no significant predictors of degree aspiration. This study shows that there are some, but that they differ between classes and sexes. In this context, the following general conclusions seem warranted:

1. Being male is most important in determining whether an advanced degree will be sought.
2. People who have been successful academically (e.g., high grade point average in high school) will be more likely to continue to aspire for advanced academic training.
3. Biology majors have relatively high aspirations.
4. Engineering, business, and education majors are relatively unmotivated to enter post-graduate training at the highest level.
5. Upperclassman females with humanities majors demonstrate relatively high academic aspiration, but those with high cultural sophistication in their background do not. This is an anomolous finding with no present explanation.

These results justify a rejection of hypothesis five. There are statistically significant predictors of degree aspiration.

Upperclassmen and Freshmen: Degree Aspiration by College Attitudes, Experiences, and Viewpoints

The next two hypotheses in this study (H_6 and H_7) will be discussed jointly. They state that there are no significant differences in measures of college experiences and perceptions among freshmen and upperclassmen at the high level of academic aspiration compared with students at the medium and low levels. These hypotheses do not examine the variables as possible predictors of aspiration level, but examine them as key characteristics of students with high degree aspirations. It is reasonable to assume that these students have characteristics other than a manifest need for academic achievement. These two hypotheses considered differences in experiences, attitudes, and viewpoints between students of high degree aspiration and those of low/medium aspiration for both upperclassmen and freshmen. Low and medium degree aspiration levels were combined to isolate and thus emphasize the difference between the highest degree aspiration and the lower degree aspirations.

As in previous analyses, a sample of traits and experiences previously found to be related to educational plans was selected from the data available. The six variables included: extracurricular activities, perceived benefit of college (other than vocational gain), the role of women, civil rights attitudes, liberalism, and satisfaction with college. The students were ranked on each variable according to the position they took or the number of items they responded to, depending on the nature of the measurement used. In some cases, the students' ranking "score" indicates the degree of agreement with accepted college outcomes. In others, it represents the degree of judged "liberalism" of attitude. The operational definition of "liberal" in this context means the degree to which an individual advocates equal rights for women, civil rights for all citizens, and other popularly defined liberal ideas. The relationship between the level of aspiration and attitude, experience and viewpoint was tested for all six variables using the Chi square technique.*

Of the six variables, five had a significant relationship to high academic aspiration for upperclassmen, the exception being perceived benefit of college (other than the vocational dimension). Among the freshmen, five variables also had a significant relationship to high academic aspiration. The one exception for this group of students was viewpoint on the role of women. Viewpoint on civil rights had the greatest relationship to high degree aspiration for both freshmen and upperclassmen.

---

*More specific information concerning the scoring for each measure can be found in Appendix C of the original report of the study (pp. 119-125). The twelve tables used for depicting the results of the analyses (Tables 18-29) are also displayed in the complete dissertation (pp. 73-80).

The freshmen's view of the role of women appeared as a bell-shaped distribution with a middle-of-the-road opinion prevailing. This distribution was nearly identical for the two aspiration categories defined for the testing of these hypotheses (high and low/medium) and was confirmed by the low Chi-square relationship found. By contrast, the upperclassmen's view of the role of women showed a markedly liberal outlook among high aspiration students which was not indicated by the low/medium students.

Over seventy-five percent of the freshmen and over sixty percent of the upperclassmen considered college to be definitely beneficial, particularly those in the high aspiration category. Students answering that college was only generally beneficial were more likely to be in the low/medium aspiration group. The relationship was highly significant for freshmen; the upperclassmen, however; were somewhat less sure of the benefits they were receiving, regardless of level of aspiration.

The distribution in low, medium, and high degrees of satisfaction with college differed between upperclassmen and freshmen. Most upperclassmen were in the medium satisfaction category; whereas in the freshman group, most were found in the high satisfaction category. The greatest proportion of both freshmen and upperclassmen in the high degree aspiration category also indicated the highest degree of satisfaction with college.

Freshmen and upperclassmen appeared quite alike in their interest in extracurricular activities. This measure reported a high, medium, or low participation in clubs, sports, and special events on campus. High degree aspiration students were disproportionately represented in medium and high participation categories, and both freshmen and upperclassmen showed a significant relationship between degree aspiration and extracurricular activities.

In both the freshman and upperclassman samples, the distribution of viewpoints on civil rights had a tendency toward liberalism. The distribution was similar between those two groups except for the high degree aspirants, where the upperclassmen were clearly more liberal than freshmen. These results corroborated previous research findings which have shown that high achievers, and therefore high degree aspirants, are more liberal than other students on civil rights issues. The same general pattern of liberalism was also found on the viewpoint on liberalism scale, though the distribution there was not heavily weighted toward the "liberal" category. Forty-four percent of the freshmen and 55 percent of the upperclassmen were represented in the two most liberal categories. The Chi square indicated a strong relationship between aspiration and the measure of viewpoint on liberalism.

From the twelve tables covering the six variables studied for these hypotheses, a class profile can be drawn indicating the order of each variable's relationship to degree aspiration. For freshmen they are: civil rights, benefit of college, extracurricular activities, liberalism, and satisfaction with college. A somewhat different profile appears for upperclassmen: civil rights, liberalism, satisfaction with college, extracurricular activities, and the role of women. Role of women was not statistically significant for freshmen, nor was benefit of college for upperclassmen.

The inferred tendency for high degree aspirants to become more liberal with increased exposure to college corroborates similar findings in previous research regarding a relationship between students' liberal tolerance and persistence in college (Feldman & Newcomb, 1969; Trent & Medsker, 1968). Thus it appears that an increased liberal attitude may well have a relationship to high degree aspiration. Indeed, most studies on this subject have shown that seniors are more liberal in their attitudes toward civil rights, civil liberties, censorship, communism, patriotism and pacificism than are lowerclassmen (Bugelski & Lester, 1940; Finney, 1967; Flacks, 1963; Foster, et al., 1961; Miller, 1959; Nelson, 1938; Newcomb, 1943; Selvin & Hagstrom, 1960).

The relationship to extracurricular activities apparent here has also been noted previosuly (Barger, 1965; Hale, 1939; Iffert, 1957; Katz & Allport, 1931; Mehus, 1934; Stern, 1963; Stright, 1947), but the major change in attitude toward the role of women from freshmen moderation to upperclassmen liberalism is a new, though consistent, finding that complicates an explanation for the comparatively lower upperclassmen female aspirations.

The following points can be made based on these results:

1. Viewpoint on civil rights has the greatest relationship to high degree aspiration for both freshmen and upperclassmen.
2. A measure of liberalism has a strong relationship to high degree aspiration for freshmen and upperclassmen.
3. Upperclassmen appear to show a stronger relationship between satisfaction with college and degree aspiration than freshmen.
4. Both upperclassmen and freshmen show a significant relationship between extracurricular activities and degree aspiration.
5. Viewpoint on the role of women by aspiration is significant only for upperclassmen.
6. Perceived benefit of college has a strong relationship to degree aspiration for freshmen and is statistically insignificant for upperclassmen.
7. Students tend to become more liberal in their views with increased exposure to college.

In sum, null hypotheses six and seven are rejected. All variables, with the exceptions pointed out, indicate that a difference exists between high degree aspirants and low/medium degree aspirants on relationships to selected attitudes, experiences, and perceptions.

Upperclassman Males and Females: Sex-related Differences on Degree Aspiration

Prior results have emphasized several differences between sexes in their aspiration for advanced academic degrees, the major differences being the considerably greater probability that a male will pursue graduate work than that a female will. The eighth hypotheses (H_8) bears on the differences between upperclassman males and females at the high level of academic aspiration.

Aside from the discrepancy in proportion of high degree aspirants, the question remains of whether or not both sexes use the same criteria in making their respective decisions to pursue a graduate degree. This hypothesis seeks further clarification of the question, using the Automatic Interaction Detector (AID) technique to sort out the criteria that most influence high aspiration, selecting them in order of decreasing importance. Student profiles were extracted from a branching-tree analysis which reveals how each characteristic entered the profile. The earlier a characteristic enters as a branch variable, the higher its correlation with aspiration.

A comparison of the tree analysis for males with that for females indicated that, for both sexes, the student's expected occupation is the most important determinant of degree aspiration. This variable is first in the branching sequence for both men and women, but plays a more important role for females. The student's major field plays the next most important role in identifying high aspirants and continues to play a selective role at more distant branch points. A number of other variables, including college grade point average, number of books in the home, father's level of education, civil rights attitudes, academic activities, and topics the respondent talks about, all have an influence, but none apparently as strong as expected occupation and major.

Student's expected occupation and college major both suggest strong goal orientation. They also suggest a definite purpose in the student's quest for an advanced degree--namely preparation for a profession. Little, if anything, suggests that graduate study is pursued by either males or females mainly for self-enrichment.

A summary of results from testing this hypothesis include the following:

1. Students' expected occupation is the most important branching variable for both males and females.
2. Females' expected occupation in the high degree aspiration group includes both Professional I (e.g., doctor, lawyer, professor) and Professional II (e.g., teacher, accountant, engineer).
3. Males' expected occupation in the high degree aspiration group includes only Professional I.
4. Females' current college major is second in branching importance, whereas freshman major is second for males.
5. Females in the high aspiration group disproportionately report majoring in biological or social science.
6. Males in the high degree aspiration group disproportionately report a freshman major in physical science, mathematics, social science, humanities, arts, or business.
7. In both the freshman and upperclassman samples, the proportion of women was lower than that for males in the high aspiration category.

From these findings it is possible to reject the eighth hypothesis. There are small but important differences between male and female high degree aspirants.

Differences Between Colleges and Universities

The ninth hypothesis (H_9) states that there are no institutional differences in degree of aspiration for freshmen and upperclassmen. It expresses the assumption that the type of school attended will not significantly contribute to a student's level of aspiration. Previous research gives every reason to beleive that students with high aspiration for professions requiring advanced degrees will more frequently choose to attend a prestigious university or a select liberal arts college than other types of institutions. It is also likely that, once there, his high ambitions will find greater acceptance and encouragement than would have been the case at another institutional type.

If the type of college does make a difference on student academic aspirations, a definite relationship should exist between schools rank-ordered for the aspiration level of their students and schools rank-ordered by the students' entering grade point average, cultural sophistication, and perception of a scholarly college environment--variables that have been shown in this study to have varying degrees of positive correlation with aspiration.

In testing this hypothesis, the institutions in the sample were ranked based on the percentage of students in each of them with high aspirations. This was done for both the freshman and upperclassman samples, and little difference was found in school rank between the two levels of students. Rank-ordered testing made comparison possible between the schools arranged by level of expressed student aspiration to attend graduate school and the schools ranked by percentage of graduates actually entering graduate school. The latter figures were gained from the Office of Institutional Research at each institution for their graduates in the years 1968, 1969, and 1970, the three years the upperclassmen in the study would most likely have graduated.

This permitted a direct comparison of stated aspiration with actual graduate school enrollment. An immediate finding was the great discrepancy between stated aspiration and actual enrollment. Other than the college that maintained its rank of first place on both stated and actual attendance, the institutions showed great differences in the percentage of students aspiring to graduate school and those actually enrolling. It is possible, however, that schools do not keep accurate records of how many of their graduates actually enroll for post-graduate training. Also, some students may delay their plans for graduate education beyond the time originally anticipated. Perhaps a more accurate picture of the congruence between graduate school aspiration and actual attendance could be gained if these students were studied over a longer period of time.

Three conclusions seem warranted from the correlations on school-ranked data:

1. Most institutions show a decline between the number of their students planning to attend graduate school and the number actually attending within the 1968-1970 period.
2. Freshman and upperclassman aspirations are highly correlated within each institution.
3. There is significant correlation among the four variables within each institution: level of degree aspiration, perceived college scholarship environment, students' entering grade point average, and level of cultural sophistication.

Based on these results it is possible to reject hypothesis nine. Further study is certainly in order, but there does appear to be an institutional difference in degree aspiration.

Summary

The general questions this study set out to explore can be summarized as follows: What factors in the pre-college background and what factors in the college experience itself are most highly correlated with a student's interest in pursuing an advanced academic or professional degree? What significant differences exist between freshmen and upperclassmen? What differences are there between males and females? Is a student's perception of the surrounding scholastic atmosphere at his school the important influence that others have suggested?

Four factors from the pre-college background appear to influence the decision to pursue a post-graduate degree: male sex, high school grade point average, high cultural sophistication, and mother's education. Of these, male sex is the strongest determinant.

The aspect of the college experience most highly correlated with academic aspiration is a major in biology. The high aspiration students are more involved than their low aspiration peers with their institutions as measured by their extracurricular activities and reported satisfaction with college. There is also a divergence between the cross-sectional differences of freshman and upperclassman women and those of their male counterparts with reference to aspiration; there is a three-to-one difference between males and females who aspire to the highest degree category as incoming freshmen.

In this study, student perception of college scholarship environment is shown to have a minimal effect on aspiration, there being no significant correlation between college scholarship environment and academic aspiration for individual students. Only with school rank-order tests could a positive relationship be shown to exist between college scholarship environment and degree aspiration, high school grade point average, and cultural sophistication.

In all, these results indicate that graduate education is definitely male-dominated and that academic achievement and a background high in cultural sophistication remain selective determinants of students who later pursue graduate education. To some extent, a student's participation in campus life and a positive attitude toward the institution in which he is enrolled may be meaningful influences, though they certainly vary by institution and may in part be predetermined by student self-selection into an established environment.

However, no one of these variables by itself can predict students with high degree aspirations. The combination of variables, including sex, cultural sophistication, and grade point average, is a fairly reliable sign of high degree aspiration, but all remain far from accurate predicators of post-graduate education. Certainly additional research is necessary before those seeking eventual high-level educational attainment can be reliably identified early in life.

Several implications of this study are clear:

1. Few women are planning to go to graduate school. This situation could well be changing, but the traditional outlook still prevails. Compared to women entering college, a much

smaller proportion of their upperclassman counterparts exhibit high academic aspirations. The "attrition rate" of female students aspiring to advanced degrees, as suggested by these cross sectional differences, is higher than for males. From this one could infer that women are discouraged, directly or indirectly, by social pressure during their undergraduate years.

2. High cultural sophistication and socioeconomic status remain major determinants of those who aspire and presumably those who actually enroll in graduate school, in spite of the fact that higher education is today more open and accessible to all classes of people than ever before.

3. The current funding problems of educational institutions, the seeming public displeasure with campus activities, and the poor job market for graduate degrees could well mark reductions in the number of students interested in and/or admitted to graduate programs. Indeed, this lack of demand appears to be causing reconsideration of whether or not students should be encouraged to obtain post-graduate training.

4. Women have few role models of other women who are both mothers and holders of advanced degrees. If and when more women become visible in positions of prestige, young women will perhaps more readily aspire to the highest degrees and professions.

5. Pre-college background and secondary education seemingly do not instill the same high occupational aspirations in women as they do in men.

THE RELATIONSHIP BETWEEN RELIGIOUS BACKGROUND AND INTELLECTUALITY IN COLLEGE

Michael Blair Schleyer*

Factors which underlie the various ways in which students progress throughout their college careers have been studied continually for the last twenty years or so. Relationships have been found indicating that certain factors played important roles in determining personality development of college students as well as academic development. For example, socioeconomic status (Hollingshead, 1949; Trent & Medsker, 1968; Tyler, 1956), parents' attitudes toward education (Sexton, 1965), and proximity to educational institutions (Medsker & Trent, 1965; Trent & Medsker, 1968) were found to be important in this respect.

The primary concern of this study was an investigation of the relationship between another possible underlying factor--religious background--and the intellectuality of college students. The two terms "religious background" and "intellectual" are used according to the following definitions.

"Religious background" means association with a religion and its accompanying attitudes, values and activities before one enters college. The supposition is made that when one indicates having been raised in a Catholic, Jewish or Protestant family--even though he may later disclaim religious beliefs associated with that religious group--he has been subjected previously to the religion's ideals, values, restrictions and beliefs, whether through the media of Church, family or community, and to some extent influenced by them.

The term "intellectual" was applied as a descriptive personality characteristic, primarily including a receptivity to change, critical thought, an openness to the ideas of others, and actions of a non-authoritarian nature.

---

*Ph.D., 1972.

The term, however, does not apply to intelligence, as it is quite possible for one with intelligence to be limited in these types of intellectual characteristics.

Past research has confirmed the opinion that the more religiously fundamental one's background was, the more of an inhibiting influence would be exerted upon his intellectual growth, at least in childhood and the adolescent period of life. But the relationship between religious background and the intellectuality of college students has historically received limited investigation. One major research project (Trent, 1967) demonstrated the negative impact of a Catholic background on intellectual development during the college years. The present study is an attempt to expand upon Trent's groundwork through new and varied psychometric techniques and scales, and to analyze and compare the relationships between Catholic, Jewish and various Protestant backgrounds and intellectuality in college.

Students from the seventy-three institutions in the Center's national survey from which both freshman and upperclassman data was obtained were selected as the sample for this study. A sample of 7,167 freshmen and 5,015 upperclassmen was available for analyses. The differentiation of the sample, according to the schema outlined by Stark and Glock (1968), is presented for freshmen in Table 1 and for upperclassmen in Table 2.

TABLE 1

Freshmen's Religious Backgrounds

Religious Background	(N)	Percent	Accumulative Protestant Percent
Catholic	(2059)	28.7	
Jewish	(638)	8.9	
Liberal Protestant	(1976)	27.6	27.6
Moderate Protestant	(1428)	19.9	47.5
Conservative Protestant	(1066)	14.9	62.4
Total	(7167)	100.0	

TABLE 2

Upperclassmen's Religious Backgrounds

Religious Background	(N)	Percent	Accumulative Protestant Percent
Catholic	(1201)	23.9	
Jewish	(332)	6.6	
Liberal Protestant	(1524)	30.4	30.4
Moderate Protestant	(1197)	23.9	54.3
Conservative Protestant	(761)	15.2	69.5
Total	(5015)	100.0	

Based on the dissertation literature review, the following framework was constructed around which objectives and hypotheses of the study were developed:

1. a. The Three major religious groups differ in their religious beliefs, and attitudes and values associated with these beliefs apparently determine intellectual growth to some extent.

   b. These values and attitudes differentiate individual denominations within the Protestant groups as well.

2. The development of intellectuality seems to be related to the relative religious fundamentalism of these groups.

3. The college experience in general influences behavior, and development of students along several intellectual dimensions occurs throughout the college experience.

4. The degree of this development in college may be affected by students' religious background.

In addition to assisting in the formation of this general framework, the literature review also raised certain issues which were formulated into the following objectives for this study:

1. to determine whether association with any particular religion, and its related degree of fundamentalism, influenced intellectual disposition (as measured at the time of college entrance);

2. to determine if this relationship between religious background and intellectual attainment was found, or perhaps persisted, at the end of the college experience;

3. to determine the relative intellectual differences between corresponding freshman and upperclassman religious groups; and

4. to examine the types of benefits expected by each religious group and determine if the types of benefits are directly related to the degree of fundamentalism of the individual group or denomination.

From these general objectives an extensive list of hypotheses was developed concerning freshmen and upperclassmen separately as well as comparatively, interpreting certain differences between them as "changes" or "developmental trends" implied by a cross-sectional research design. The multiplicity of these hypotheses precludes a listing of them both in this introduction and in the report of the findings which follow, where they will be considered on a more global dimension than was the case in the original writing.

Analyses

The Function of Religious Background

> There will be no significant differences found among the five groups of freshmen and upperclassmen--Catholic, Jewish, Liberal Protestant, Moderate Protestant, and Conservative Protestant--on all measures of intellectuality considered together.

Testing for significant differences among the five groups of both freshmen and upperclassmen was done by employing multivariate analysis of variance. This analysis considered only the religious background of the students as a basis for comparing scores on all measures of intellectual attainment. The data relevant to this hypothesis, for both class groupings of students, are shown in Tables 3 and 4.

From these two tables it can be seen that there were significant intellectual differences between the five religious deliniations. Although the succeeding hypotheses attempt to determine where these differences lie, the rejection of this hypothesis was essential to the decision to carry on an investigation of the others.

The Function of Socioeconomic Status

> There will be no significant interaction between religious background and socioeconomic status when comparing intellective scores of the five groups.

On the basis of father's occupation and parents' annual income, the five religious groups (both as freshmen and upperclassmen) were found to have had significantly different backgrounds in this respect. The Jewish group was characterized as having fathers predominantly in professional employment categories, earning high wages. The Liberal and Moderate Protestant groups were almost identical to each other, reporting their socioeconomic levels to be more equally divided between the professional and managerial levels. The Catholic and Conservative Protestant groups were also similar in that the

TABLE 3
Multivariate Test of Equality of Mean Vectors
for "Religious Background" (Freshmen)

Variable	Hypothesis Mean Squared	Univariate F	P
1. Students in high school class attending college	60.10	70.93	.01
2. Decision about college attendance	19.17	7.30	.01
3. Friends attending college	26.47	37.96	.01
4. Plan to enroll in graduate school	8.20	30.81	.01
5. Books in home	95.15	69.30	.01
6. National and State Politics Activity Scale	122.58	33.38	.01
7. Total Arts Activity Scale	702.89	18.82	.01
8. Religious Activity Scale	757.52	164.37	.01
9. Science Activity Scale	36.20	8.67	.01
10. Political Activism Scale	36.61	87.07	.01
11. Changing Society - Occurring	29.83	2.14	.07
12. Changing Society - Desirable	72.77	11.06	.01
13. Educational Benefits - Vocational	10.27	7.63	.01
14. Educational Benefits - Liberal	6.26	1.68	.15
15. Autonomy	240.76	53.91	.01
16. Complexity	422.31	38.04	.01
17. Theoretical Orientation	213.08	19.27	.01

F-Ration for multivariate test of equality of mean vectors = 28.81
D.F. = 72 and 27775.91; p less than .01
D.F. for hypothesis = 4
D.F. for error = 7080

TABLE 4
Multivariate Test of Equality of Mean Vectors
for "Religious Background" (Upperclassmen)

Variable		Hypothesis Mean Squared	Univariate F	P
1.	Plan to enroll in graduate school	3.65	14.78	.01
2.	National and State Politics Activity Scale	95.96	23.99	.01
3.	Total Arts Activity Scale	311.42	8.68	.01
4.	Religious Activity Scale	311.51	72.23	.01
5.	Science Activity Scale	13.59	3.47	.01
6.	Political Activism Scale	18.99	40.00	.01
7.	Changing Society - Occurring	17.21	1.30	.27
8.	Changing Society - Desirable	65.89	9.76	.01
9.	Educational Benefits - Vocational	1.87	1.72	.14
10.	Educational Benefits - Liberal	6.92	3.23	.01
11.	Autonomy	79.49	17.39	.01
12.	Complexity	167.68	14.59	.01
13.	Theoretical Orientation	122.47	11.65	.01

F-Ratio for multivariate test of equality of mean vectors = 14.81
D.F. = 56. and 19128.25; p less than .01
D.F. for hypothesis = 4
D.F. for error = 4930

great majority were reported to be from the medium socioeconomic level; the Conservative Protestants, however, had proportionately more of their sample from the lower and less from the higher categories than any other group.

Even with these great differences among groups, however, controlling for this background factor produced no changes in the relationship between religious background and freshman or upperclassman intellectuality. A multivariate testing for interaction between religious background and socioeconomic status indicated that for both samples, no interaction occurred, and that (1) intellectual differences among groups attributed to religious background persisted at each level of socioeconomic status, and that (2) the differences found between the five groups on the measures of intellectuality were not greatly affected by the relative socioeconomic levels of the members of the groups. Thus, the intellectual differences found among religious groups in this study cannot be dismissed as a question of social class rather than religious background.

The Function of Area of Residence

> There will be no significant interaction found between religious background and area of residence.

Large differences existed again among the five groups in respect to their pre-college areas of residence. Jewish students came almost entirely from large urban environments as did the Catholic students; the three Protestant groups were distributed much more evenly among the rural, small urban, and large urban environments. However, when this variable was tested for interaction, none was evident. Intellectual differences attributed to religious background still persisted, and did not vary according to previous home environments.

The Function of Sex

> There will be no significant interaction found between religious background and sex.

In controlling for the sex variable, interactions were found in both samples. In the freshman sample, the sex distributions contributed to the variance in scores among the five religious groups, affecting five of the seventeen variables employed: high school classmates attending college, number of books in home, educational benefits - vocational and liberal dimensions, and science activity. Only two variables were affected by this interaction in the upperclassman sample: the activity scales for national and state politics and for religion. Thus, on a few specific test scores in each sample, intellectual differences among the groups of students could not be attributed to religious background alone, but to some extent, to the sex of the members of the groups also.

The Function of Academic Aptitude

> Significant differences found among the five groups of freshmen and upperclassmen will not be significantly altered when academic aptitude is a covariate.

Care was taken to distinguish academic aptitude from intellectuality. If one religious group entering college was found to have had a higher level of academic aptitude, perhaps the intellectual characteristics attributed to that group were not due to its religious background, but rather to this measure of intelligence.

Three predominant clusters of groups emerged when examining this variable. The Jewish group had almost three-fifths of its population at the high aptitude level and was the only group in either sample to have a majority of students thus coded. The Catholic, Liberal Protestant and Moderate Protestant groups were quite similar in that each had less than a majority of students at this higher level. The Conservative Protestant group was the antithesis of the Jewish group, with only one-fourth of its population coded in the high aptitude category.

Although other researchers have found a moderate relationship between academic aptitude and intellectual disposition, the intellectual relationships established among religious groups in this study were shown to be only slightly affected by this variable.

The Role of Religious Fundamentalism

> The ordered outcome of the five freshman and upperclassman groups' scores on the measures of intellectuality considered together will not be directly related to the relative degrees of religious fundamentalism of the individual groups.

This hypothesis was made to establish a more definite and meaningful relationship between religious background and intellectuality. Using a form of discriminant analysis (canonical variation) it was possible to interpret the relationships between the fundamentalism of the five groups according to their relative degrees of intellectual attainment. From this method, three distinct clusters of groups were found to be in evidence in a very similar manner among both the freshman and upperclassman samples, as follows:

1. The Jewish group, designated previously as the most religiously liberal of the groups being considered, was found to possess the highest degree of intellectual attainment, as defined by the variables discussed in the introduction. The margin of difference between the Jewish group and the next cluster was very large, and the differences were consistent on virtually every individual item and scale tested.

2. The Liberal Protestant, Moderate Protestant and Catholic students were located in this cluster, though further analysis demonstrated a fundamental difference between the two Protestant groups and the Catholic group. Whereas the Liberal and Moderate Protestant students were quite similar with respect to most variables tested and maintained an independence from the Jewish group on the one side and the Conservative Protestant group on the other, the Catholic group tended to fluctuate on individual items and scale scores.

3. The last cluster consisted solely of the Conservative Protestant students. This group, the most religiously fundamental of the five groups tested, displayed the lowest overall degree of intellectual attainment. It was not only greatly differentiated from the Jewish group, but from the other Protestant and Catholic groups as well.

It may be concluded that the intellectual differences observed among religious groups were strongly related to the degree of fundamentalism of the individual groups; the more fundamental the group, the less it was intellectually-oriented generally. Also, it could be inferred from cross-sectional comparison that the nature of an individual's religious background has a definite impact throughout the college experience, as this ordering of denominational groups was not unique to the freshmen, but was the same for the upperclassmen. Therefore the hypothesis must be rejected.

Factors Associated with Pre-College Intellectual Growth

> When testing items concerning implied family, peer and community influences, the scores of the Conservative Protestant and Catholic students will indicate a lack of influence toward greater intellectual pursuits from these sources, followed by the Moderate Protestant, Liberal Protestant and Jewish students respectively in ascending order.

The relationship between family religious beliefs and the intellectual growth of children was reinforced by the findings of this study. The closer the family's association with more conservative theological doctrines, and the more rigid they were in following those defined teachings and beliefs, the less interest was shown in providing intellectual stimuli in the home.

The findings concerning peer and community factors associated with intellectual growth were similar. The students with more religiously liberal backgrounds were found to have had more close friends and high school classmates preparing to enter college than students with more fundamental backgrounds. Assuming that close peers are a source of motivation, it is likely that students with more religiously liberal backgrounds received greater support from their peers to attend college.

Educational Orientation*

When presented with the prospect of vocationally-oriented college benefits, the freshmen differed in their responses according to their respective religious backgrounds. A greater proportion of the Conservative Protestant and Catholic students expected vocational benefits than did the other groups, followed by the Liberal and Moderate Protestant and Jewish students. Yet, it was found that all five freshman groups desired a liberal arts education in college to a similar extent.

Surprisingly, the opposite results were found when the upperclassmen reported what educational benefits they actually received while in college. All groups similarly responded that they had received vocationally-oriented benefits from their college experiences; whereas only the Catholic group indicated a greater liberally-oriented educational experience, reporting that they had gained more in the areas of aesthetic sensitivity, broadened literary acquaintance and appreciation, and critical thinking.

An interesting phenomenon surfaces from these considerations. All freshmen students, regardless of their religious backgrounds, expected to receive a varied assortment of experiences in college, but only the Catholic group felt that these expectations had been realized at the conclusion of the college experience. Further, groups of freshmen differed concerning their expectations for vocationally-oriented college experiences, yet, as upperclassmen, all students reported receiving an equal share of vocational training.

---

*Discussions following topic headings with asterisks are related to more than one hypothesis, and thus, rather than listing them all, their common elements and findings are considered.

Activity and Interest in Various Aspects of Society*

Findings concerning student activities and interests agreed generally with the pattern of group intellectuality already established. As freshmen, the Conservative Protestants were the least active in the areas of national and state politics and science. In the arts, the group fared better, showing interest and activity comparable to its more liberal counterparts. A small degree of political activism was characteristic. As upperclassmen, the Conservative Protestant students scored significantly below all other groups on each of the four activity scales.

The Catholic freshmen conveyed extreme disinterest in the arts, scoring well below all other students in the study. Activity was higher in the area of national and state politics, however. As upperclassmen, the Catholic group consistently scored significantly higher than the Conservative Protestant students; in the arts, political activism, science and general political activity, the Catholics equalled, and sometimes excelled, the activity of the Moderate and Liberal Protestants.

The Liberal Protestant and Moderate Protestant groups appeared to have similar interests and activities in these areas both as freshmen and upperclassmen. While not as active as the Jewish group, these groups maintained a rather high rate of activity, greatly surpassing the Conservative Protestants and in several cases the Catholics. The Jewish group, in both samples and on every variable, demonstrated that the least fundamental of all groups was also the most involved in affairs of the society.

The scores on the religious activity scale showed a reverse ordering of the religious groups than did the scores on the other activity scales, except for the Catholics, whose reported activities were much like those of the Liberal Protestants.

Receptivity to Change

> On the scale measuring receptivity to various changes in the society, the more religiously fundamental groups will be less receptive to societal changes than will the more religiously liberal groups.

One scale in the present study attempted to measure students' attitudes toward changes thought to be occurring in the society. Generally the groups of students, both as freshmen and upperclassmen, responded to this measure according to their relative degrees of religious fundamentalism. The least fundamental group (Jewish) expressed the greatest degree of acceptance of societal change, while the most fundamental group (Conservative Protestant) thought these changes to be the least desirable. One group deviated from the prediction in both samples: the Catholic students favored change in the society to a greater extent than expected, approximating the positive attitudes of the Jewish and Liberal Protestant groups.

Aspects of the Intellectual Personality

> The more religiously fundamental the group of students, the less intellectually-oriented its members will be, as shown by the three scales measuring various psychological aspects of intellectual behavior: autonomy, complexity and theoretical orientation.

Three distinct clusters of groups were identified when students responded to three scales designed to distinguish certain personality traits. Jewish students in both samples displayed the most autonomous and experimental behavior as well as the most logical, critical thinking. The Catholic, Moderate Protestant and Liberal Protestant students were essentially similar on each variable. The Conservative Protestant group displayed the least development on each of these intellectual traits.

Intellectual Differences Between the Freshmen and the Upperclassmen*

All groups exhibited significant decreases in their respective scores on the two educational benefits scales (vocational and liberal) when comparing the freshman scores with those of the upperclassmen, indicating that the college experience was seen as less productive by the upperclassmen than was hoped for by the incoming freshmen.

The college experience was expected to influence intellectual growth by opening new and varied fields of exploration for the college student. In comparing the scores of the respective freshman and upperclassman groups, significant increases in national and state political activity were found for all five groups.

In science, the arts and political activism, significant increases were found only for certain groups of students, as follows:

1. In comparing freshman and upperclassman scores, the Catholic sample showed significant increases in activity in all areas. The Catholic upperclassmen surpassed the Conservative Protestants in political activism, equalling that of the Moderate and Liberal Protestants. In the arts, where as freshmen they had ranked below the Conservative Protestants, the upperclass Catholics showed significantly greater artistic activity.
2. The Liberal and Moderate Protestant groups showed significant increases in scientific activity when comparing the freshman and upperclassman samples.
3. The Conservative Protestant and Jewish students showed no significant increases other than in national and state politics.

Although the actual scores of all groups decreased on the Religious Activity scale, only the three Protestant groups significantly decreased their religious activity as upperclassmen. The college experience apparently had no substantial liberalizing effect on the Jewish and Catholic students with reference to religious activity.

Reasons for this may have been different for these two groups, however. The freshman Jewish students were extremely non-active in the religious area; any further decrease in religious activity on the part of the upperclassmen could not have been very plausible. A speculative reason for the Catholic group's failure to decrease their religious activity could be that the Catholic students attending Catholic colleges in the sample maintained their religious commitments, while the secular college Catholics did not. This situation may have balanced out the entire group's score.

Each of the five groups showed a significant increase in their respective scores on the Changing Society scale, demonstrating a greater intellectual attainment as upperclassmen by their increased willingness to accept societal changes.

When comparing the scores of the freshmen and upperclassmen on scales concerning autonomy, complexity and theoretical orientation, only the upperclassmen in certain religious groups had a significantly greater intellectual disposition than their freshman counterparts. The results can be summarized as follows:

1. The Conservative Protestant upperclassmen, on all three scales, showed significantly greater intellectual disposition than had the Conservative Protestant freshmen.
2. The Catholic students, like the Conservative Protestants, were found to have had a greater intellectual disposition as upperclassmen.
3. The Moderate Protestant upperclassmen were found to have shown significantly greater intellectual characteristics by their responses to the Complexity and Theoretical Orientation scales. Greater autonomous behavior, however, was not evident.
4. The Liberal Protestant and Jewish upperclassmen were no more intellectually-oriented in these respects than were the corresponding freshman students.

Religious Profiles

Based on the results of the analyses presented above, and some other minor findings omitted in this report of the study, profiles of each of the five religious groups studied may be constructed. The general characteristics of each group are considered in the following discussion, highlighting the importance of religious background to the intellectual development of college students.

Conservative Protestant Students

The Conservative Protestant students were hypothesized to be, along with the Catholic sample, the most fundamentally-oriented group in the study. Previous research had indicated that a strong dedication to God and the church, to religious doctrine, and a generally high degree of religious activity were characteristic of this Protestant group. Accordingly, it was anticipated that these ties would contribute negatively to the intellectuality of these college attenders; this was, in fact, the case. As freshmen, the Conservative Protestant students displayed the least intellectual orientation overall, and except for certain areas such as activity in the arts, demonstrated this characteristic on virtually every item and scale.

When comparing the Conservative Protestant freshmen and upperclassmen, the upperclassmen were significantly more intellectual along several dimensions. These apparent intellectual advances, although welcomed, must be regarded in a more relative context, however. Even though the Conservative Protestant upperclassmen had higher intellective scores than had the freshmen, they remained as far, and in certain instances even farther, below the measured intellectual level of the other students as upperclassmen than they had as entering freshmen.

A deep regard for what are considered to be the more pragmatic aspects of personality development seems to exist today among the fundamental Protestant denominations. A strict adherence to the Protestant ethic, when maintained in today's society, does not seem to permit a great expansion of ideas or the rise of a more universal man prepared to exist productively in a pluralistic society. The fundamentalist Protestant Church assumes a role which appears to perpetuate the blockage of these ideals. Its enforcement of religious doctrine and continued maintenance of the status quo limits the intellectual capabilities of its members, and in doing so, furthers the existence of the Church much as it was in the past.

The Conservative Protestant students in this study were greatly influenced by their religious backgrounds. Although the college experience presented new and varied events for discovery, and indeed seemed to add a greater intellectual depth to their personalities, the degree of development was not compensatory enough for their early disposition to bring them to a level commensurate with other students in the study.

Catholic Students

From the literature it had seemed apparent that the Roman Catholic Church and family influences would be a detrimental to the intellectual attainment of the individual as had been the case with the Conservative Protestants. As late as 1967, a comprehensive research project had demonstrated the relative lack of intellectuality among Catholic students in both Catholic and secular colleges (Trent, 1967). The Catholics in Trent's sample had entered college with few intellectual characteristics, and graduated with few; a minimum growth was found during those years.

The Catholic sample in this study, however, demonstrated that this was no longer an accurate description. The Catholic freshmen entered college with a greater degree of intellectual orientation than was expected, having attained the overall level of their Liberal and Moderate Protestant counterparts. Fluctuation on individual intellective scores indicated that the Catholic freshmen were not as consistent as the Protestants in all areas of intellectuality tested, however. The Catholic students' interest and activity in the arts, for example, was extremely low in relation to other groups; but on other items, such as interest in science and the desire to enroll in graduate school, their motivation was somewhat higher than that of the Protestant groups.

The Catholic upperclassmen were significantly more intellectual on most dimensions than were the Catholic freshmen. They were the only students to significantly differ in their degree of political activism and activity in the arts as upperclassmen. Unlike the Conservative Protestants' apparent advances, the Catholics' apparent intellectual advances were large enough to surpass the Liberal Protestants in many respects; the Catholic group clustered with the Jewish group on several occasions, also.

At the conclusion of the college experience, then, the Catholics still appeared much like the Liberal and Moderate Protestant students in relation to overall intellectual attainment, but tended to score in a more intellectual direction on several measured dimensions.

A reason for these findings might be that a rather intensive self-examination of the Roman Catholic Church had been going on for some time before the sample was surveyed. The Second Vatican Council early in the 1960's favored critical exploration; many individuals within the Church identified its shortcomings, and research supported those contentions. Evidently this re-direction had an effect. Less rigid enforcement of religious dogma in the Church, and an attitude that one can learn to question yet exist within the framework of the Church, may have been responsible for the greater Catholic intellectuality since Trent's investigation.

While the Catholic students are still attending less selective types of colleges and universities in large numbers, it may be concluded that this group was most ready for the intellectual opportunities offered at those institutions: the Catholics seemingly took greater advantage of the college environment than any other group in the study, and as shown by the upperclassman data, expressed greater awareness of the liberal arts benefits received during those years.

Moderate Protestant Students

Data from the present study indicated that the Moderate Protestant denominations may have undergone a process of social assimilation. The activities and values expressed by the Moderate Protestant students, in fact, were in many cases similar to those of their more religiously liberal Protestant counterparts. Stark and Glock (1968) demonstrated distinctly different theological commitments for moderate and liberal Protestant denominations in the United States, but these differences may have become minimized in the past few years, especially among families of college attenders. In overall intellectual attainment, the Moderate Protestant freshman group demonstrated few significant differences from their more liberal counterparts, although they did tend to score lower on many variables. As upperclassmen the situation was similar.

One characteristic of the Moderate Protestant sample that differentiated it from the Liberal Protestant group was its apparent increase in intellectual attainment over the college years, evidenced by significant differences between freshman and upperclassman scores. For example, a significant increase in a desire to enroll in graduate school and greater autonomous behavior were observed.

Liberal Protestant Students

The Liberal Protestant sample was found to be the most consistent in obtaining the highest level of intellectual behavior of the three Protestant groups. Although few significant differences were found between this group and the Moderate Protestants, more numerous and greater differences were found in comparison with the Conservative Protestant sample.

Data concerning the two Liberal Protestant samples, freshmen and upperclassmen, indicated that--although this group had entered college with the highest degree of intellectuality among the Protestant groups and remained in that same comparative position as upperclassmen--relatively little "development" along the various measured dimensions was evident. Even though the Liberal Protestants had attended more selective types of institutions in greater numbers, the effect of that attendance was not in evidence. Apparently the college experience had less of an impact upon the intellectual advances of this group than upon its more religiously conservative counterparts.

Jewish Students

The Jewish sample in this study consistently displayed the most intellectual characteristics of any group tested. The overall differences between this group and the other four were extreme and existed throughout the analysis. As entering freshmen, the Jewish students already had achieved a high degree of intellectual orientation. Their religious and family backgrounds apparently had fostered an interest in various aspects of the society and an openness to change before their college enrollment. As upperclassmen these characteristics were still prevalent; the Jewish group remained the most intellectually inclined. However, like the Liberal Protestants, few intellectual advances from the freshmen year to the final college years were evident.

Several possible explanations can be suggested for this later finding. A "ceiling" effect may have been responsible, though the author tends to minimize this possibility because significant advances were made on some variables. It is likely that significant increases could have been expected on other items as well. Also, the fact that the Liberal Protestants likewise experienced few intellectual advances, yet scored well below the Jewish group both as freshmen and upperclassmen, seems to negate such a theory. It could be that the items used were not sufficiently sensitive to demonstrate behavioral changes for this group, or that a longitudinal design may have provided more exact and differing results from those found by the cross-sectional analysis employed in this study. A more acceptable theory may be that the more religiously liberal groups were not as receptive as the fundamental groups to the intellectual stimuli offered by the colleges they attended. It seems likely that the intellectual offerings of the college campus had been, to a large extent, experienced by the Jewish and Liberal Protestant students before college entrance, and that these students reacted less noticeably to the variety of activities and the many ideas and value orientations found on campus.

Summary and Implications

The hypothesis testing and these short profiles drawn from the data provided suggest that religious background strongly affects intellectual characteristics. Sizeable differences were found in the attitudes, interests and activities of entering college students in accordance with their respective religious backgrounds. Those students with more religiously liberal family backgrounds consistently were found to be more open to change, more interested in a wider variety of activities in our society, and generally displaying more intellectually-oriented personalities.

Another central finding was that the relationship between religious background and intellectuality conformed to a consistent pattern of group performance throughout the study: the more fundamentally-oriented the religious background, the less intellectual characteristics were exhibited. Furthermore, the college experience, with its recognized capacity to change attitudes and values, did not minimize the intellectual differences between those with varying religious background. By the conclusion of the college years, great intellectual differences between upperclass religious groups still persisted.

On a national basis, the term "Protestant" does not denote a singularity of being or a oneness of character in terms of the present study. The many sharp contrasts between the Conservative, Moderate and Liberal Protestant groups seem to deny their consideration as a unified whole. Lenski (1961) stated that his data revealed "few significant differences among Protestant denominations which did not reflect differences in the class position or regional background of individual members." He probably found a greater similarity between denominations because of his relatively homogeneous sample of Detroit Protestants; on a national scale his conclusions appear to be unfounded.

The present study uncovered extreme intellectual differences between persons of the more conservative Protestant denominations and those from liberal Protestant denominations, even within such a homogeneous group as college attenders. Significant differences between moderate and liberal Protestants and between moderate and conservative Protestants occurred as well, even when considering class position and regional background in the analysis. Variations between the Protestant groups were found among values, attitudes and activities; the ways in which they anticipated and interpreted the college experience; and their intellectual advances between the two stages of testing.

An opinion that can be drawn from these findings is that a desire for intellectual growth is not inherent, and must first be recognized as a developmental characteristic, then evaluated, and finally considered to be of enough worth to elicit a desire for change in that direction. If one has a recognition of and concern for the intellectual development of members of our society, numerous implications concerning the church, the family and formal education can be found in the present data. Some of them have already been explored above, but several require further discussion here.

Intellectuality in itself denies the perpetuation of existing values which preserve the status quo. Since the relationship between intellectuality and religious background has been shown to be strong, values and attitudes associated with the churches must be re-evaluated constantly. It should be recognized by all churches that change is inevitable, and that if control over the though process is enforced in a society where education becomes more adequate and intense, the church and its members will find it increasingly more difficult to coexist. It stands to lose not only its more intellectual members, but even its credibility with the people in general.

The conservative Protestant churches may begin to recognize this need for self-evaluation more readily than others in the near future. Their members were shown to be the least intellectual of all college attenders in this study. In order to maintain a competitive status in today's society, the conservative Protestant churches, like the Catholic Church before them, must face this problem, for to deny its members the intellectual growth of which they are capable is to deny development of its own future.

Yet, the Jewish, Catholic and more liberal and moderal Protestant churches must not be content with the present. A further understanding of the effects of religious fundamentalism on the development of the individual should be a prime concern of them all. The negative aspects of religious association must be recognized, evaluated and changed to permit the continuance of the many positive ones, indeed the continuance of a force vital to the well-being of so many in our society.

The current data also has implications for higher education in the United States. In recent years colleges and universities have been moving further from the practice of classifying students according to sex, race and religious background or preference. This plan has been successful in eliminating some of the long-existing practices of discrimination. Yet, intellectual growth is a major goal of educational institutions, and evidence of greater striving toward that goal might be shown by the collection of information concerning religious backgrounds of students and their corresponding attitudes. From this effort, interests and possible reactions to the college experience could be anticipated and proper guidance functions relating to these increased understandings and a structuring of more meaningful college curricula and experiences could be established.

The data in this study pointed to a greater vocational orientation by the Catholic and Conservative Protestant group members than the other three groups, yet these groups did not express, as upperclassmen, any greater attainment of vocationally-oriented benefits than the other groups. Perhaps for these students, as well as others entering college with this goal high in priority, a re-orientation concerning the diverse advantages of a college education might well be justified. Although it is folly to deny the importance of vocational studies for many in our society, the prospect of broadening one's mind by learning in various academic areas can probably also prepare the student to participate in more than his chosen area of specialization if need be. With a greater exposure to other areas of education, he could more likely adapt readily to change when affected by it during his lifetime. Many people futilely seek employment today as a result of not being familiar enough with other fields to which they could adapt their skills and knowledge.

Certain aspects of education have been neglected in the backgrounds of several academic subgroups in this study. The arts, for example, have been low in priority for students from Catholic and Conservative Protestant backgrounds. In various other educational areas, wide ranges of exposure and interest by religious groups was evident. The students, away from the home and its governing influences, may for the first time be receptive to experiences presenting new and varied ideas for their contemplation. The college campus may thus be seen as an environment in which to present lectures, seminars and experiences which will help bridge these cultural gaps.

But the colleges must not be concerned only with students lacking in intellectual characteristics, for it was recognized here that higher education

2

may have affected only minimally those students entering with highly developed intellectual dispositions. The Jewish and Liberal Protestants made few intellectual advances during their four years of college experience. The possibility that colleges neglect the presentation of a more stimulating environment through extra offerings, advanced seminars, student-initiated projects and the like, is a real one. Casual acceptance of students with apparently high degrees of intellectual attainment can limit, in effect, their college careers, making the experience no more meaningful than an extension of the same interests and activities related to their years in high school. Acceptance of the intellectual status quo, at any level in college, can be self-defeating, and may tend to exclude the chances of further personal development in many critical areas.

The data in this study have only begun to illuminate the many facets of intellectuality pertaining to college students; only suggestions based on the dimensions of intellectuality recognized here could be made. Much more research will be needed to supplement these findings in such a global area of concern. The data analyzed and interpreted here indicate the need for a longitudinal study of the dimensions considered. In no other way can institutional effects be measured more adequately, regardless of refinements of the cross-sectional technique. A comprehensive study of students who dropped out of college during these years would also be helpful in distinguishing more accurately between societal and educational influences.

Another extension of the current research would further delineate students in each religious category by the type of college they attended. Such an analysis could investigate developmental trends of Jewish students at highly selective universities compared to their Jewish counterparts in other settings, for example; and the intellectual advances made by fundamentalist Protestants (or other groups) at denominational colleges, teachers colleges, or selective liberal arts schools would help refine the presentation. It would be possible, then, to determine the specific environmental influences of campuses in reference to the five groups of students tested in this study.

The findings of this study suggest that studying the effects of religious background should not be minimized, but rather, intensified, by clerical and lay scholars alike. Moreover, this type of evaluation and commentary should be encouraged among the ranks of church attenders themselves, for the realization of one's own characteristics is the first step toward the initiation of change. Religious background--the direct influences of church and family attitudes associated with the teachings of a church--does determine strongly the intellectual characteristics of individual members of the family. If we, then, as educators, clerics, researchers, critical commentators, or just private individuals better understand the complexities and implications of this relationship and proceed to concern ourselves with data and theory such as is presented here, we will have moved closer to a goal of intellectual growth in persons on our campuses and in society.

MAJOR FIELD TRANSFER:
THE SELF-MATCHING OF UNIVERSITY UNDERGRADUATES TO STUDENT CHARACTERISTICS

Lawrence Kent Kojaku*

As a growing majority of American youth enter post-secondary education, the issue of student selection of an institution in which to continue his educational experience, whether it be a personally appropriate institution or a personally fulfilling curricular specialization, deserves increased study. The initial decisions which young people make concerning their educational plans are often tentative. Prior research has indicated that generally one-third to one-half of university graduates change from one major field to another (Bradley, 1962; Gamble, 1962; Pierson, 1962; Warren, 1961). Corroboration of these previous findings was found in the current investigation, in which 44 percent of the sample made a major field change. The nature of this widespread behavioral phenomenon in higher education and some explanations for its occurrence were the subject of this study.

The phenomenon of student transfer from one major field to another was examined in this study, with a particular focus on the relationship between major field transfer and the personal attributes and cognitive styles associated with various major fields of study. More specifically, an attempt was made to find out if, when undergraduates transfer from one area to another, they are matching some of their own characteristics with those of the students in the major fields that they enter, a practice henceforth referred to as self-matching.

This investigation assessed whether students making major field transfers are more similar to students in the field they leave or in the fields they enter on measures of achievement, occupational orientation, aestheticism, attitudes, family background, aptitude, and personality traits. Thus, the study examined whether on the above student characteristics there is greater homogeneity within fields and greater heterogeneity between fields after curricular transfer. Separate analyses were performed by sex.

---

*Ph.D., 1972.

The subjects indicated their major fields as freshmen and as upperclassmen from among ten major fields. These choices were matched against measures of ten student characteristics: high school grade average, sureness of post-college job, aesthetic activities, awareness of contemporary social trends, willingness to accept social change, socioeconomic status of parents, verbal aptitude, autonomy and nonauthoritarianism, complexity or tolerance for ambiguity, and theoretical orientation.

These ten variables were selected because of their relevance to the previous research literature in this area and their inclusion in the survey instrument. They were not meant to represent a definitive set of student characteristics relative to this topic; there are certainly many other personal attributes which can be included in parallel research on major field transfer. Likewise, the particular technique selected to analyze the data was by no means intended to be presented as the definitive method of analysis for testing self-matching in curricular transfer.

This investigation rejected an opposing approach to major field transfer, which views curricular mobility or instability as associated with characteristics of students across fields, that is, with attributes common to all those who change major fields or all who do not, regardless of major field. However, there is no intention here to disprove hypotheses not specifically tested. This study is solely designed to support the notion expressed as follows in a descriptive study by Abe and Holland (1965, p. 1):

> Satisfying choices require some matching of student characteristics and competencies with the demands of the prospective field of study. When a student's characteristics resemble those of the typical student in his prospective field, he is likely to feel at home and remain in his field. Conversely, incongruities between a student and his field result in feelings of alienation and dissatisfaction and usually lead to a change of plans.

The sample selected for this study was comprised of the 1880 upperclassmen respondents attending the seventeen highly selective and comprehensive general universities in the Center's national survey data bank. There were 390 respondents from four highly selective universities, public and private, and 1490 respondents from thirteen comprehensive general universities, public and private.

As an adjunct to this study, a sample of freshman respondents who responded to the higher education survey's freshman questionnaire was used to support the "fixed trait" nature of the variables. These 2484 members of the class of 1972 were sampled from the same universities and at the same time as the upperclassmen. Thus it was possible to compare the mean scores of the freshman major fields as indicated by the present study's sample of upperclassmen with the major field mean scores of the survey's actual freshman sample.

Two hypotheses pertain to the objectives of this study. Stated according to the null hypothesis, they are as follows:

H_1 The ratio of the between-fields to the within-fields variability is as likely to decrease as it is to increase after major field transfer has occurred during the period between the first and third years of university attendance.

H_2 For both males and females, the ratio of the between-fields to the within-fields variability is as likely to decrease as it is to increase after major field transfer has occurred during the period between the first and the third years of university attendance.

Analyses

The analyses in this study used the nature of the F ratio: that the numerator, the estimated variance between groups, is a measure of the non-homogeneity of the groups themselves; and that the denominator, the estimated variance within the groups, measures the non-homogeneity of individuals within each group. In applying the F ratio to the problem of major field transfer, it can be seen that for each variable the denominator represents an estimate of the variability of student scores within major fields, while the numberator reflects the differences in variability observed as a function of differences among the ten major fields. The average within-fields variance for each variable indicates within-fields homogeneity, and the variance of the field means for each variable indicates between-fields differences.

Since, for the purposes of this study, the F ratio in a one-way analysis of variance is the ratio of the variance of major field means to the average within-fields variance, the self-matching hypothesis predicts an increase in the F ratio after transfer for each variable. Because the total variance on a single measure is fixed, it can be shown algebraically that an increase in the between-fields variance necessarily involves a decrease in the within-fields variance, and vice versa. Thus an increase in the F ratio for each variable indicates that the difference between fields and the (average) homogeneity within fields both increase.

For this analysis, the original study sample (N = 1801) could not be used in its entirety because the same number of subjects did not respond to every variable. A subsample of 1732 respondents having complete data for all ten variables was used in obtaining the F ratios, so that the respondents could be compared with one another.

The specific major hypothesis of this investigation concerned the likelihood that increased within-fields homogeneity and increased between-fields heterogeneity may occur for ten variables. In order to test this hypothesis, the sign test was used. It is based on the binomial distribution, which is usually described as the sample distribution of random effects drawn from a two-class population. When obtained scores can fall into one of two classes, the binomial distribution may be used to test the hypothesis that there is a given probability that one alternative occurs more than another in the population. In this study the upperclassman F ratios will be either higher or lower than the corresponding freshman F ratios. The sign test of the study hypothesis examines whether the probability that the resulting number of upperclassman F ratios which are higher than freshman F ratios is due to more than chance.

Tables 1, 2, and 3 present the mean scores and rank orders on the ten variables of the freshman major field choices, of the persisters in major fields, and of the major fields of upperclassmen. These three sets of scores and order of rank for majors on each score revealed that on at least one group of variables major fields have similar profiles. In general, the ten variables can be divided into two loose groupings. With varying degrees of similarity between any two variables in the group, six measures share similar patterns of major field mean scores and rank orders: Aesthetic Involvement, Changing Society--Desirable, Parents' Socioeconomic Status, Vocabulary, Autonomy, and Complexity. One of the study's remaining four variables, High School Grade Average, is somewhat related to the six above, because its major field score order slightly resembles that of Parents' Socioeconomic Status. However, High School Grade Average has a pattern of scores very similar to that of Theoretical Orientation, a variable with a mean score and rank order

TABLE 1

Student Characteristics and Major Fields:
Mean Scores and Rank Orders of Freshman Major Field Choices

Variable	Major Field Mean Scores and Rank Orders (in parentheses)										
	Physical sciences or Math	Biological sciences	Social sciences	Language	Humanities	Arts	Engineering	Business	Education	Other	No major
High School Grade Average	5.03 (2)	4.82 (3)	4.62 (7)	5.07 (1)	4.70 (5)	4.35 (9)	4.47 (8)	3.94 (11)	4.72 (4)	4.64 (6)	4.33 (10)
Post-College Job Sureness	2.03 (10)	2.27 (4)	2.10 (7)	2.18 (5)	2.06 (8)	2.35 (2)	2.05 (9)	2.11 (6)	2.66 (1)	2.29 (3)	1.78 (11)
Aesthetic Involvement	15.17 (9)	16.26 (8)	17.57 (4)	19.62 (3)	19.74 (2)	20.22 (1)	12.62 (11)	14.85 (10)	17.23 (5)	16.80 (6)	16.31 (7)
Changing Society--Occurring	17.38 (10)	17.44 (9)	17.85 (6)	17.66 (7)	17.88 (5)	17.91 (2.5)	17.48 (8)	17.91 (2.5)	18.03 (1)	17.90 (4)	17.08 (11)
Changing Society--Desirable	7.70 (5)	7.44 (8)	8.16 (1.5)	7.94 (3)	7.63 (6)	8.16 (1.5)	7.31 (9)	7.09 (11)	7.24 (10)	7.71 (4)	7.47 (7)
Parents' Socioeconomic Status	19.59 (4)	19.47 (5)	19.81 (3)	20.98 (1)	19.98 (2)	19.10 (7)	17.56 (11)	18.13 (8)	17.72 (10)	19.30 (6)	17.91 (9)
Vocabulary	12.69 (4)	12.66 (5)	13.23 (3)	13.77 (1.5)	13.77 (1.5)	12.31 (7)	10.25 (11)	10.69 (10)	11.42 (9)	11.56 (8)	12.63 (6)
Autonomy	7.19 (5)	7.28 (4)	7.53 (3)	6.93 (8)	7.64 (1)	6.91 (9)	6.99 (7)	6.79 (10)	6.56 (11)	7.12 (6)	7.62 (2)
Complexity	13.65 (8)	14.18 (6)	14.58 (4)	14.19 (5)	15.10 (1)	15.00 (2)	13.16 (9)	12.83 (11)	13.08 (10)	13.86 (7)	14.72 (3)
Theoretical Orientation	9.53 (1)	8.99 (2)	7.55 (6)	7.74 (4)	7.58 (5)	7.15 (9)	8.97 (3)	6.89 (10)	6.54 (11)	7.17 (8)	7.51 (7)

TABLE 2

Student Characteristics and Major Fields:
Mean Scores and Rank Orders of Persisters in Major Fields

Variable	Major Field Mean Scores and Rank Orders (in parentheses)									
	Physical sciences or Math	Biological sciences	Social sciences	Language	Humanities	Arts	Engineering	Business	Education	Other
High School Grade Average	5.14 (1)	4.93 (3)	4.56 (8)	4.96 (2)	4.75 (4.5)	4.15 (9)	4.66 (6)	4.02 (10)	4.65 (7)	4.75 (4.5)
Post-College Job Sureness	2.14 (6)	2.34 (3)	2.05 (9.5)	2.28 (4)	2.11 (8)	2.46 (2)	2.12 (7)	2.06 (9.5)	2.77 (1)	2.24 (5)
Aesthetic Involvement	14.94 (8)	15.20 (7)	17.49 (4)	18.76 (3)	20.03 (2)	20.78 (1)	11.71 (10)	13.80 (9)	17.15 (5)	16.15 (6)
Changing Society--Occurring	16.71 (10)	17.24 (7)	17.97 (3)	16.72 (9)	18.00 (2)	17.60 (6)	16.83 (8)	18.39 (1)	17.93 (4)	17.88 (5)
Changing Society--Desirable	7.50 (4)	7.18 (7.5)	8.32 (1)	7.28 (6)	7.43 (5)	7.95 (2)	7.07 (10)	7.18 (7.5)	7.13 (9)	7.67 (3)
Parents' Socioeconomic Status	19.44 (6)	19.65 (5)	19.80 (4)	21.84 (1)	20.23 (2)	19.83 (3)	17.03 (10)	18.66 (8)	17.38 (9)	18.78 (7)
Vocabulary	12.94 (4)	12.60 (5)	13.41 (2)	13.36 (3)	13.97 (1)	12.35 (6)	9.84 (10)	10.59 (9)	11.40 (7)	10.98 (8)
Autonomy	7.17 (3)	6.95 (6)	7.65 (2)	6.32 (10)	7.76 (1)	7.05 (4)	6.97 (5)	6.39 (9)	6.53 (7)	6.90 (8)
Complexity	13.60 (5)	13.48 (7)	14.78 (2)	13.52 (6)	15.33 (1)	14.65 (3)	12.90 (8)	12.32 (10)	12.80 (9)	13.68 (4)
Theoretical Orientation	10.08 (1)	9.54 (2)	7.72 (4)	6.72 (8)	7.50 (5)	6.78 (7)	9.25 (3)	6.93 (6)	6.38 (10)	6.64 (9)

TABLE 3

Student Characteristics and Major Fields: Mean Scores and Rank Orders of Upperclassman Major Field Choices

Variable	Major Field Mean Scores and Rank Orders (in parentheses)									
	Physical sciences or Math	Biological sciences	Social sciences	Language	Humanities	Arts	Engineering	Business	Education	Other
High School Grade Average	5.00 (1)	4.94 (3)	4.63 (6)	4.98 (2)	4.83 (4)	4.32 (9)	4.61 (7)	4.15 (10)	4.58 (8)	4.70 (5)
Post-College Job Sureness	2.14 (5.5)	2.33 (2)	1.94 (10)	2.14 (5.5)	2.03 (9)	2.27 (3)	2.11 (7)	2.06 (8)	2.66 (1)	2.18 (4)
Aesthetic Involvement	14.61 (8)	14.91 (7)	17.47 (5)	17.52 (3)	19.25 (2)	21.08 (1)	11.74 (10)	14.02 (9)	17.49 (4)	16.65 (6)
Changing Society--Occurring	17.06 (7)	17.17 (6)	18.17 (2)	16.85 (10)	17.57 (5)	16.99 (8)	16.96 (9)	18.28 (1)	18.00 (3)	17.66 (4)
Changing Society--Desirable	7.50 (5)	7.19 (8)	8.24 (1)	7.18 (9)	7.60 (4)	7.71 (2)	7.08 (10)	7.30 (7)	7.44 (6)	7.70 (3)
Parents' Socioeconomic Status	19.16 (7)	19.66 (5)	19.81 (4)	21.17 (1)	19.93 (2)	19.88 (3)	17.06 (10)	18.27 (8)	17.59 (9)	19.29 (6)
Vocabulary	12.88 (4)	12.39 (5)	13.40 (3)	13.69 (2)	13.74 (1)	12.29 (6)	9.93 (10)	10.49 (9)	11.38 (7)	11.29 (8)
Autonomy	7.14 (4)	6.88 (6)	7.67 (2)	6.83 (8)	7.86 (1)	7.49 (3)	6.87 (7)	6.63 (10)	6.75 (9)	6.97 (5)
Complexity	13.51 (6)	13.58 (7)	14.77 (3)	13.83 (4)	15.39 (1)	15.12 (2)	12.99 (9)	12.65 (10)	13.35 (8)	13.78 (5)
Theoretical Orientation	9.95 (1)	9.67 (2)	8.07 (4)	6.70 (10)	7.63 (5)	7.08 (7)	9.44 (3)	7.23 (6)	6.76 (9)	7.07 (8)

profile very different from that of the first six variables mentioned. The patterns of major field scores on Theoretical Orientation, Changing Society--Occurring, and Post-College Job Sureness are usually different from those of the aforementioned six related variables. Thus, in drawing a general picture of the mean score and rank order profile of a major field, the description will usually be divided in terms of these two groupings of variables.

Although it is difficult to find indications of self-matching in the scores and rankings of the major fields of freshmen, persisters and upperclassmen, some evidence of this process exists in these descriptive findings. There appear to be instances of the accentuation of major field differences after curricular transfer. For example, the variable Theoretical Orientation is closely associated with the natural and applied sciences. On Theoretical Orientation, physical sciences/math ranks first, biological sciences second, and engineering ranks third consistently for freshman, persister, and upperclassman major field choices. An examination of the actual mean scores of these three major fields reveals that all three upperclassman mean scores on Theoretical Orientation are higher than the freshman scores, suggesting that differences are accentuated after major field transfer. The opposite accentuation pattern, in which upperclassman mean scores are lower than freshman scores, can be seen for the same three major fields in their scores on Aesthetic Involvement, a variable not traditionally associated with natural and applied sciences. Thus, there is evidence of increased between-fields differences in the mean scores of the major fields, one indication of the occurrence of self-matching in curricular transfer.

In relating the mean score profiles of major fields to the patterns of frequencies in major field migrations, other issues can be raised. For example, defection from certain major fields and recruitment into certain fields are associated with high or low mean scores on certain variables. The three major fields which scored highest on Theoretical Orientation (physical sciences/math, biological sciences, and engineering) all suffered net losses in enrollment. However, the three fields with the highest freshman major field scores on Complexity, and even higher upperclassman scores on that variable, (humanities, social sciences, and arts) all experienced net gains in enrollment. Although such findings must be viewed in the context of other variables, they suggest that in the sample more students placed a positive value on Complexity, or a negative value on Theoretical Orientation, when they selected another field into which they desired to transfer.

As can be seen in Tables 1, 2, and 3, the same score patterns occur for the freshman, persister and upperclassman major field choices with reference to the ten variables in most cases. However, in the few cases in which differences between the three groups were noted, this description emphasizes data from the persisters and upperclassmen, the groups most typical of a major field.

The two natural sciences produced similar patterns of mean scores on the study variables. Physical sciences/math yielded mean scores in the middle range on all variables except for high ranking scores on High School Grade Average and Theoretical Orientation, and a low score on Changing Society--Occurring. Similarly, the mean scores of the biological sciences were in the middle range, with the exception, again, of high ranking scores on High School Grade Average and Theoretical Orientation. In addition, biological sciences scored high on Post-College Job Sureness, and low on Changing Society--Desirable.

The overall patterns of mean scores for the following four fields are generally parallel. Social sciences produced a mixture of score rankings mostly in the high-to-middle range; one exception was the low score of social sciences on Post-College Job Sureness. Mixed score rankings mostly in the high-to-middle range were also characteristic of language, with the exception of three variables on which language ranked low: Autonomy, Changing Society--Occurring, and Theoretical Orientation. Humanities yielded high scores on six variables: Aesthetic Involvement, Changing Society--Occurring, Parents' Socioeconomic Status, Vocabulary, Autonomy, and Complexity. On High School Grade Average, Changing Society--Desirable, and Theoretical Orientation, humanities ranked in the middle; but on Post-College Job Sureness, humanities had a low score. Arts is less similar to the other three major fields in this group, in spite of the high-to-middle range of most of its scores. Unlike the other three fields, arts ranked low on High School Grade Average, in the middle on Vocabulary, and high on Post-College Job Sureness.

Three professional fields comprise the next curricular group sharing similar profiles of mean scores and rankings. Engineering scores ranked low on all the variables except Theoretical Orientation, on which they were high, and on Autonomy, where the score was in the middle range. Low scores also characterized business, with the exception of a high score on Changing Society--Occurring, and a middle ranking on Theoretical Orientation. Education produced low ranking scores on six variables. However, there were middle ranking scores in education for Aesthetic Involvement and Vocabulary, and high scores on Post-College Job Sureness and Changing Society--Occurring.

The mean scores of "other" major fields were in the middle-to-low range, with the exception of a high ranking score on Changing Society--Desirable. Finally, the freshman choice of no major field yielded high mean scores for two variables, Autonomy and Complexity, and low rankings for High School

Grade Average, Post-College Job Sureness, Changing Society--Occurring, and Parents' Socioeconomic Status.

The overall mean score patterns of the major fields confirm previous research findings of similar tripartite groupings of declared major fields (Davis, 1965; Pace, 1967). However, a number of provocative questions arise as a result of these findings. For example, a cross-field comparison of Autonomy scores revealed that the Autonomy scores of language majors were consistently lower than those obtained by students majoring in engineering. One might have expected the reverse because of the broad range of areas that are represented by language study and its close association with the liberal arts. However, language majors may represent a unique group of students, as evidenced by their significant departure from the comparatively high scores of other liberal arts majors.

Another interesting finding was the high score of art majors on Post-College Job Sureness. Apparently because fine arts students learn more specialized skills, they have a markedly higher occupational orientation than liberal arts students. Finally, in examining the mean score patterns of freshmen with no major, it is perhaps understandable why undecided students rank high on Autonomy and Complexity and score low on Post-College Job Sureness. However, there is not as obvious an explanation for the low ranking of undecided freshmen on Parents' Socioeconomic Status.

The analysis of the changing major field enrollments resulting from curricular transfer further indicated that a higher proportion of females than males elected to major in language, humanities, arts, education and "other" fields. Conversely, a much higher percentage of males than females chose engineering and business. The selective university sample had a greater proportion of humanities majors, while a higher percentage of the general university sample selected business and education.

The examination of the relation between the study variables and patterns of curricular transfer revealed that in some variables and major fields the accentuation of initial differences occurs after curricular transfer. The greater total mean score differences occurring between the major field choices of upperclassmen than between those of freshmen suggest increased between-fields differences. Patterns of mean scores and rank orders for most major fields of the total sample indicated that three variables (Post-College Job Sureness, Changing Society--Occurring, and Theoretical Orientation) and sometimes a fourth (High School Grade Average) produced different profiles from those of the remaining variables. Comparisons between males and females and between highly selective universities and general comprehensive universities revealed that differences in major field score and ranking profiles were most pronounced on the Changing Society scales and Parents' Socioeconomic Status.

The score patterns of those in the total sample majoring in the nine specified content areas fell into three loose groups. The physical and biological sciences had scores and rankings in the middle range. Higher score patterns occurred for social sciences, language, humanities, and arts. The three professional fields of engineering, business, and education had the lowest score profiles. The major field scores generally fell into the same three groups for both selective and general universities and for males and females. In the comparison of sex, there were overall differences between male and female mean scores in two major fields: males had higher score rankings than females in arts, and females scored higher than males in engineering.

As a preface to a discussion of the results of the analyses as they pertain directly to the previously stated hypotheses, the appropriateness of investigating the shifting of students among major fields over a period of time while using nonlongitudinal data is established in the following comments.

This study examined the characteristics of students in relation to their freshman major field choices and of upperclassman major field choices, using data only on the characteristics of upperclassmen. Such a procedure infers that these characteristics would remain unchanged during the time span between the first and the third or fourth year of college. In order to ascertain the stability of the variable scores over time, a cross-sectional comparison of two samples was made. The mean scores of the freshman major field choices of the study's upperclassman sample were compared with the major field mean scores of the survey's actual freshman sample.

Since this comparison is concerned more with the position of major field scores in relation to one another, rather than with absolute score value differences between the two samples, the means were rank ordered for each of the ten variables studied. Table 4 illustrates that 76 percent of these pairs of field mean scores for each variable were within two places of each other in the rank orders. Closely parallel patterns of scores can be found by comparing the two sets of mean scores of males, females, respondents from selective universities, and respondents from general universities.

In order to obtain a more precise measure of the relationship between the freshman major field scores of the upperclassman sample's freshman choices and the survey freshman sample, the rank difference correlation or Spearman's rho was calculated. Like other correlation methods, such as the Pearson product-moment correlation coefficient, this non-parametric technique indicates the degree of relationship between two variables. However, Spearman's rho is subject to less error than the product-moment coefficient when the samples are relatively small (in this case 11 major fields) and also when measurement has only the power of the ordinal scale.

TABLE 4
A Comparison of the Survey Freshman Sample and the Freshman Major Field Choices of the Study Sample (in parentheses): Rank Orders of Mean Scores and Rank-Difference Correlations

Variable	Rank Order of Major Fields											
	Physical sciences or Math	Biological sciences	Social sciences	Languages	Humanities	Arts	Engineering	Business	Education	Other	No major	Spearman Rho Correlation
High School Grade Average	2 (2)	3 (3)	4 (7)	1 (1)	9 (5)	6 (9)	8 (8)	11 (11)	10 (4)	7 (6)	5 (10)	.56
Post-College Job Sureness	6 (10)	2.5 (4)	8.5 (7)	10 (5)	8.5 (8)	4 (2)	7 (9)	5 (6)	1 (1)	2.5 (3)	11 (11)	.76
Aesthetic Involvement	9 (9)	8 (8)	3 (4)	6 (3)	2 (2)	1 (1)	10 (11)	11 (10)	7 (5)	5 (6)	4 (7)	.88
Changing Society--Occurring	6 (10)	4 (9)	1 (6)	5 (7)	2 (5)	9 (2.5)	7 (8)	3 (2.5)	11 (1)	8 (4)	10 (11)	-.09
Changing Society--Desirable	5 (5)	4 (8)	3 (1.5)	1 (3)	2 (6)	6 (1.5)	8 (9)	10 (10)	11 (11)	7 (4)	9 (7)	.66
Parents' Socioeconomic Status	7 (4)	6 (5)	4 (3)	2 (1.5)	1 (1.5)	5 (7)	9 (11)	11 (8)	10 (10)	8 (6)	3 (9)	.70
Vocabulary	6 (4)	5 (5)	3 (3)	1 (1.5)	2 (1.5)	7 (7)	9 (11)	10 (10)	11 (9)	8 (8)	4 (6)	.87
Autonomy	6 (5)	7 (4)	2 (3)	5 (8)	1 (1)	4 (9)	8 (7)	9 (10)	11 (11)	10 (6)	3 (2)	.71
Complexity	7 (8)	6 (6)	3 (4)	5 (5)	2 (1)	1 (2)	9 (9)	11 (11)	10 (10)	8 (7)	4 (3)	.73
Theoretical Orientation	1 (1)	3 (2)	5 (6)	9 (4)	6 (5)	8 (9)	2 (3)	10 (10)	11 (11)	7 (8)	4 (7)	.86

The last column in Table 4 presents the rank difference correlation coefficients obtained from the mean scores of the two samples. If Guilford's (1956) rough guide to describing the magnitude of correlation is used, it can be seen that one variable, Changing Society--Occurring, has a slightly negative rho coefficient very different from the rest. This coefficient indicates a "slight, almost negligible (negative) relationship." Two variables, High School Grade Average and Changing Society--Desirable, have rho correlations between .40 and .70, which indicates a "moderate correlation, substantial relationship." The remaining seven variables have correlation coefficients between .70 and .90. Guilford characterizes coefficients of that magnitude as having a "high correlation, marked relationship." Thus, the substantial similarity between the score rankings of the freshman major field choices of upperclassmen and those of the survey's actual freshman sample provides a basis for considering the study's variables as having a fixed character with respect to the interrelationships among fields.

In testing Hypothesis 1, an F ratio was computed for the freshman major field choices on each of the ten variables, and on the ten variables for the upperclassman field choices. In Table 5, for each variable, an upperclassman and a freshman pair of F statistics is presented, along with an indication of whether the upperclassman F is larger than the freshman F. Also, at the right of the table is the actual fraction from which each F ratio was computed.

Table 5 illustrates that the F statistics computed for each of the variable means of the total sample's major fields as upperclassmen were higher than those of their majors as freshmen by at least 50 percent, with one exception. On High School Grade Average, the upperclassman F was lower than the freshman F. Thus, in the total sample, for nine out of ten variables, there was an increase in the within-field homogeneity and a consequent increase in the between-field heterogeneity.

TABLE 5
Changes in Major Field F Ratios: Total

Variable	F[a]		Direction of Change	$\frac{\text{Between-fields var.}}{\text{Within-fields var.}}$	
	Freshman	Upperclassman		Freshman	Upperclassman
High School Grade Average	11.21	10.22	decrease	$\frac{14.05}{1.25}$	$\frac{12.82}{1.25}$
Post-College Job Sureness	9.09	14.66	increase	$\frac{4.88}{0.54}$	$\frac{7.69}{0.52}$
Aesthetic Involvement	13.57	22.47	increase	$\frac{450.57}{33.20}$	$\frac{723.90}{32.21}$
Changing Society--Occurring	1.42*	3.93	increase	$\frac{16.87}{11.90}$	$\frac{46.63}{11.86}$
Changing Society--Desirable	3.37	5.17	increase	$\frac{20.41}{6.05}$	$\frac{31.10}{6.01}$
Parents' Socioeconomic Status	4.05	6.07	increase	$\frac{142.37}{35.18}$	$\frac{211.61}{34.86}$
Vocabulary	13.96	21.80	increase	$\frac{194.09}{13.91}$	$\frac{293.77}{13.48}$
Autonomy	3.88	8.82	increase	$\frac{17.56}{4.52}$	$\frac{38.97}{4.42}$
Complexity	7.27	14.30	increase	$\frac{78.20}{10.75}$	$\frac{149.00}{10.42}$
Theoretical Orientation	11.90	18.39	increase	$\frac{122.78}{10.31}$	$\frac{185.31}{10.08}$

[a] N = 1732 (complete data sample)

*p . Not significant (.01 level)

Since the total variability of the sample is constant, an increase in the variance between fields necessarily results in a decrease in the within-fields variance. That is, if differences between fields grow greater, then the people majoring in each field must become more similar to one another. However, it should be noted in the F fractions of Table 5 that the increased F's of the upperclassmen were more the result of increased between-fields variance (numerator) than of decreased within-fields variance (denominator).

The foregoing results still do not test the specific null hypothesis, which postulates that it is equally likely that the ten pairs of F statistics will decrease or increase. The null hypothesis can be tested by using the sign test, which is based on the binomial distribution. By adapting Siegel's (1956) explanation to the problem of this study, if the null hypothesis were true, it would be expected that half of the pairs of F ratios would show a higher upperclassman F and half would show a higher freshman F--a result which would be expected by chance.

The sign test is a one-tailed test when an advance prediction states which sign (or direction of change) will occur more frequently, such as in this instance where the substantive hypothesis was that there will be increased between-fields heterogeneity and increased within-fields homogeneity for the upperclassman major field choices. The level of significance was set at .05, and the sign test result supported the conclusion that it is more likely that within-fields variance will decrease and between-fields variance will increase after major field transfer occurs.

The sign test of the second null hypothesis yielded exactly the same result for both the F statistics of males in Table 6, and of females as presented in Table 7. The occurrence of only one variable with a decreasing F out of ten in the data of each sex was again significant at the .05 level.

TABLE 6
Changes in Major Field F Ratios: Males

Variable	F^a		Direction of Change	$\frac{\text{Between-fields var.}}{\text{Within-fields var.}}$	
	Fresh-man	Upper classman		Fresh-man	Upper-classman
High School Grade Average	7.92	7.87	decrease	$\frac{11.56}{1.46}$	$\frac{11.57}{1.47}$
Post-College Job Sureness	3.27	6.76	increase	$\frac{1.86}{0.57}$	$\frac{3.73}{0.55}$
Aesthetic Involvement	10.70	17.25	increase	$\frac{378.45}{35.38}$	$\frac{584.22}{33.86}$
Changing Society--Occurring	1.32*	2.88	increase	$\frac{15.03}{11.35}$	$\frac{32.21}{11.20}$
Changing Society--Desirable	2.78	3.56	increase	$\frac{17.19}{6.18}$	$\frac{21.89}{6.15}$
Parents' Socioeconomic Status	3.70	5.06	increase	$\frac{126.49}{34.19}$	$\frac{171.46}{33.87}$
Vocabulary	10.10	16.41	increase	$\frac{142.82}{14.14}$	$\frac{222.46}{13.56}$
Autonomy	3.01	5.54	increase	$\frac{14.17}{4.70}$	$\frac{25.51}{4.61}$
Complexity	5.27	9.66	increase	$\frac{56.10}{10.64}$	$\frac{99.46}{10.30}$
Theoretical Orientation	7.14	12.12	increase	$\frac{78.07}{10.94}$	$\frac{127.92}{10.56}$

[a] N = 1007 (complete data sample)

*p - Not significant (.01 level)

TABLE 7
Changes in Major Field F Ratios: Females

Variable	F^a		Direction of Change	$\frac{\text{Between-fields var.}}{\text{Within-fields var.}}$	
	Freshman	Upperclassman		Freshman	Upperclassman
High School Grade Average	3.97	5.37	increase	$\frac{3.84}{0.97}$	$\frac{5.12}{0.95}$
Post-College Job Sureness	7.49	9.32	increase	$\frac{3.68}{0.49}$	$\frac{4.53}{0.48}$
Aesthetic Involvement	4.08	5.12	increase	$\frac{123.01}{30.16}$	$\frac{153.19}{29.91}$
Changing Society--Occurring	2.41	1.82*	decrease	$\frac{30.55}{12.67}$	$\frac{23.29}{12.79}$
Changing Society--Desirable	1.94*	2.29	increase	$\frac{11.37}{5.85}$	$\frac{13.33}{5.83}$
Parents' Socioeconomic Status	1.68*	2.53	increase	$\frac{61.56}{36.58}$	$\frac{91.69}{36.23}$
Vocabulary	5.12	6.99	increase	$\frac{69.58}{13.59}$	$\frac{93.43}{13.37}$
Autonomy	1.88*	3.89	increase	$\frac{7.98}{4.25}$	$\frac{16.17}{4.15}$
Complexity	3.01	5.45	increase	$\frac{32.73}{10.88}$	$\frac{57.74}{10.60}$
Theoretical Orientation	5.45	6.42	increase	$\frac{51.56}{9.46}$	$\frac{60.38}{9.40}$

[a] N = 725 (complete data sample)

*p - Not significant (.01 level)

Because males markedly outnumbered females in the total sample, the one variable, High School Grade Average, with a decreasing F statistic of the male sample was the same as in the total sample. However, the one variable with a decreasing F in the female sample was not reflected in the total sample's F statistics. As in the total sample and the male sample, the one variable which did not have a significant F ratio was Changing Society--Occurring. However, in the female sample that variable was also the one with the decreasing upperclassman F statistic.

Tables 6 and 7 include indicators of slight differences between males and females in the within-fields homogeneity and between-fields heterogeneity reflected by the F fraction. Although the increased F statistics of upperclassmen resulted from great increases in between-fields variance rather than great decreases in within-fields variance for both sexes, this was especially the case for females.

While the primary concern of this study was to test the hypotheses by what Tukey (1969) calls confirmatory data analysis, opportunities for exploratory data analysis should not be ignored. The F values obtained to test the hypotheses can also be discussed as indicators, which include, according to Mosteller and Tukey (1968), "any hints and suggestions obtained from data by an understandable process...informative to a reasonable man (p.100)." Thus, although this analysis of the data does not meet the classical assumptions of a F test, it is possible to examine the F statistics as ratios of two variances. Because the F test gives the adjusted significance of differences between groups, the F statistics could be viewed as F ratios only in order to ascertain which of the ten variables significantly differentiate major fields.

All but one of the F values of the total sample in Table 5 and of the male sample in Table 6 are significant at the .01 level. The one non-significant F ratio of a variable occurred in the F's of the freshman major field choices, while all the upperclassman F ratios of the total and male samples are significant. These findings imply that there was significant differentiation among major field groups.

In examining the F ratios for additional descriptive indicators, further differences between the males and females are revealed. For males, as well as for the total sample, only one F statistic was non-significant but four F's were non-significant for females, including one upperclassman F. In addition, a comparison of Tables 6 and 7 reveals that the magnitude of the female F values was noticeably smaller than those of males. Furthermore, while in all but one of the variables of the total and male samples the F statistics increased 50 percent or more from freshman to upperclassman major field choices, for females such increases in F ratios occurred with respect to only two variables. Although these data cannot be interpreted in a rigorous manner or assigned a clear statistical meaning, they suggest a difference between the males and females. Although for both males and females there was a trend toward the accentuation of initial major field differences, the differentiation of fields among females was initially less than it was among males and continued to be less clearly established.

The variable in this investigation which yielded results least supportive of the hypotheses was Changing Society--Occurring. Consistently, the mean scores of the major field choices of freshmen, persisters, defectors, and upperclassmen on Changing Society--Occurring did not conform to their overall score ranking patterns on the other variables. This was the case for the variable profiles of both males and females and of both selective and general universities, as well as of the total sample. Changing Society--

Occurring was the only variable in which there was not correlation between the scores of the survey freshmen sample and those of the freshman major field choices of the study (upperclassman) sample. Moreover, it was the only variable in the analysis of variance which yielded more than one non-significant F value. That is, using the F's obtained as statements of probable variability, the F statistic of Changing Society--Occurring indicated that the scores of students in various major fields on that variable did not differ significantly.

Conclusions and Recommendations

The findings of this study support the self-matching theory of major field transfer. Apparently, university undergraduates are at least partially motivated to leave a major field because they perceive some disparity between their own attitudes and the characteristics of fellow students in their initial major field choice. Students who change majors select their subsequent major field, to a marked degree, on the basis of whether they perceive their characteristics to match those of the students who major in a given field. As a result of this self-matching process, the major field choices of upperclassmen are more different between fields and more similar within each field than are the freshman choices, according to the data of this investigation.

The results of this study disagree with those found by two other researchers (Watley & Werts, 1969; Werts & Watley, 1968), who used the same analysis of variance procedure to test the self-matching theory and concluded that their results did not support the "birds of a feather" theory. The differences they found between males and females also were not substantially reflected in this study. In speculating on the possible explanation for the difference between the results of Watley and Werts's study and those of the present investigation, it should be noted that the former study had an exclusively high aptitude sample and that only four variables were used to test their hypothesis. However, one variable which Werts and Watley found to yield an F ratio pair with a decreasing direction of change, high school grade point average, was found to yield the same result in the present study.

Thus, of the reported previous research on major field transfer, the one methodologically sound study which does not support the self-matching theory yielded results which can be questioned. Although the sample and instrumentation do not exactly replicate the study by Werts and Watley, the two investigations are similar in that two of their four variables were included in the present investigation.

In evaluating the effectiveness of the various elements of this study, a few problems arise. The ten variables used in this investigation have been treated and discussed as if they were completely discrete and independent measures. However, it is obvious that some of these variables are related to each other and are not psychometrically independent. Preliminary factor analyses of the variables by the Higher Education Evaluation Program describe these interrelationships, but were not available in a final state for this study. With such additional information, the interpretations of the results that these variables yield could have been much more complete and in depth.

Many recommendations for further research can be made based on this study.

1. These data or similar data should be analyzed to find the specific relationship between each variable and persistence in major fields. In a preliminary analysis of these data, which was not included in this study, Post-College Job Sureness and persistence in all fields

were cross-tabulated, yielding a result of borderline statistical significance. In order for the self-matching theory to be exhaustively proved, curricular persistence or transfer per se--that is, instability of choice regardless of major field--should not be highly associated with any of the variables studied.

2. More nearly equal samples of institutional types should be studied. In this investigation, the sample sizes of one of the two types of universities was so much smaller than the other (selective university N = 385; general university N = 1416) that a comparative analysis of variance could not be performed. Differences were also found between the two types of universities in the study, indicating that future research should compare major field transfer patterns among other (perhaps more disparate) types of institutions.
3. Complete data should be collected from each respondent. A complete data sample is necessary in order to perform the kind of comparative analysis of variance done in this study. Moreover, in research studying respondent changes, in which the sample is divided into many cells (in this study over 100 cells), for any given variable a case of incomplete data may be crucial because of the small number in many of the cells.
4. Major fields should be written in the survey instrument by the respondents and then hand-coded into categories according to the investigator's own criteria. In this study, one cannot be certain regarding how the respondents interpreted the categories of major fields printed in the questionnaire. Thus, since the precise departments included in a major field category are not known, interpreting the

results in the terms of subject content or in relation to previously found departmental characteristics is dangerous.

5. Certainly other types of data should be used to further examine self-matching in curricular transfer. Common types of data not used in this investigation, but which should be used, include standardized achievement and aptitude test scores, complete personality test scores, occupational preference inventory scores, and information from census tract data.
6. Perhaps most important, other methods of analyzing data should be performed to test the self-matching theory in major field transfer. An obvious alternative to this study's analysis of variance procedure is the centour score and dispersion matrix method used by Cole, Wilson, and Tiedeman (1964). If research additionally includes actual predictions of subsequent major fields from the characteristics of entering students, there would be many more possible analysis techniques.

Besides the contribution which findings such as those obtained by this study make to the theoretical conceptualization of the correlates of student flow in higher education, the results of this study also have more practical applications. The very fact that self-matching is involved in major field transfer should be of interest to many university and departmental administrators and institutional research officers. Departmental and university admissions officials should consider the match between the whole range of an applicant's characteristics vis-a-vis those of the students in the field for which he is seeking admittance. If enrollment in an academic program is limited, one of the major criteria for selection should be the expected persistence in that program. The results of this study imply that the match between the characteristics of a student and those of the other students in a field is one basis for predicting persistence in that field.

The results of this study should be of interest to secondary school and university counselors. Academic and career guidance is a major function of student personnel services during young adulthood. Counselors should collect and make available to a student information on his own characteristics and on the characteristics of groups in curricular or vocational fields. By helping a student to recognize the relationship or match between his own profile of attributes and those of people in various groups, the student can make more informed decisions and plans. Of course, the findings of this study are not directly applicable to the counseling situation. However, similar test data on any counselee could be easily converted into valuable guidance information, as outlined by Prediger (1971).

The descriptive information yielded by this investigation may have significant implications for curriculum planning, evaluation, and reform. An institutional study modeled after this investigation would provide a given department with information as to the whole range of characteristics of entering freshmen, the characteristics of groups of students defecting into particular other fields, the characteristics of recruits into the department from each of the other fields, and the characteristics of the persisters remaining in the department. Thus, a department could make plans for not only enrollment changes, but also for changes in the characteristics of its students at different levels of progress in the department.

A more serious question involves the implications of these major field changes for the curriculum and instruction in departments. Faculty members in a given department should ask themselves whether they desire students with certain characteristics to defect, persist or enter the department. For example, faculty in departments of engineering, education and business should ask themselves whether they want to keep and attract students who score low on most of the variables of this study while losing higher scorers. If any elements in the major change process are undesirable, their causes should be investigated, and when found, attempts should be initiated to alter contributing situations.

WOMEN: PERSONAL AND ENVIRONMENTAL FACTORS IN ROLE IDENTIFICATION AND CAREER CHOICE

Felice Karman*

This study was designed to explore the psychological and sociological characteristics that describe the roles of two types of women--those who choose to pursue stereotypic masculine careers and those who elect stereotypic feminine careers--focusing on background features as well as current life styles. The theoretical framework for this study is based on the orientation of role theory as defined by Theodore Sarbin (1954, p. 225), conceptualized as:

> a patterned sequence of learned actions or deeds performed by a person in an interaction situation. The organizing of individual actions is a product of the perceptual and cognitive behavior of person A upon observing person B. On the basis of this conceptualization of the actions of B, A expects certain further actions from B. This expectation is covert, and is the equivalent of saying "locates or names the position of the other." Once having located or named the position of the other, A performs certain acts which have been learned as belonging to the reciprocal position; these actions are conceptualized as A's role.

The role may be that of an individual as she performs in a reciprocal manner to the perceived role, for example, of mother, father, husband, and institution, or the society in which she lives.

In addition to role-role conflict, Sarbin also recognizes, as a possible further source of dissonance, the intervening variable of self, which is the phenomenal experience of one's identity. Self is the person as an organization of qualities--what the person is as compared to what she does (self-role conflict). Self is inferred from acts, and is described by adjectives (curious, worried, punctual, etc.).

---

*Ed.D., 1972.

The current interest in alternative female roles has implications relevant particularly to higher education where the general direction of vocational choice approaches finality. Research indicates that college counselors in general and men counselors in particular are unable to cope effectively with women students who are in the formative stage of career development (Gurin, Nachmann, & Segal, 1963; Surette, 1967; Trent & Medsker, 1968). Other literature indicates that administrators of higher education institutions are being faced with demands from female activists for changes in curricula, policy making boards, and personnel practices (Trecker, 1971). This study provides some implicative results for consideration by revealing certain underlying dynamics of career choice among women.

Questionnaires of 1,646 female upperclassman from thirty-eight of the institutions in the Center data bank were selected randomly for use in this study. That sample of 1,646 women was then divided into two categories: those aspiring to careers in occupational fields where women represent the large majority of the work force, and those whose goals were in fields where women represent a small minority of those employed. The descriptive terms, "traditionals" and "non-traditionals," are used to identify these two groups throughout the study.

Analyses

The distribution of career choices among women in the sample was the most potent evidence that women's occupational aspirations are influened by other than chance factors. As shown in Table 1, less than six percent of the 1,646 women upperclassmen aspired to non-stereotypic feminine careers. As the figures show, career choices centered mostly around the teaching profession, with half of the remaining 94 percent preparing for such positions. Forty-two percent

TABLE 1

Career Aspirations of 1,646 Upperclassman Women Students in 38 Colleges Throughout the United States

Career Aspiration	Number	Percent
Traditional Careers		
Teacher	803	52.0
Counselor, social worker	94	5.7
Nurse or other health worker (lab technician and other medical technologist)	77	4.6
Librarian	28	1.7
Housewife	10	.6
Other	211	12.8
Total Traditional	1223	74.4
Non-Traditional Careers		
Scientist (physicist, chemist, meteorologist, oceanographer)	20	1.0
Clinical psychologist	15	.7
Physician	14	.7
Lawyer	11	.5
Government executive or politician	10	.5
Computer specialist	7	.4
Pharmacist	6	.3
Engineer	3	.2
Certified public accountant	3	.2
Business executive	3	.2
Mathematician	3	.2
Dentist	1	.08
Bank president	1	.08
Veterinarian	1	.08
Total Non-Traditional	109	6.60
Don't Know	314	19.0
Total Sample	1,646	100.0

of those in the traditional career category were planning to become counselors, social workers, librarians, laboratory technicians or nurses.

The most frequently mentioned career choices among the non-traditionals were scientist, clinical psychologist and physician. Over half (51 percent) of all women with non-traditional career choices had elected one of these three occupations. One purpose of this study was to determine, within the limits of available data, what factors function to result in such disproportionate figures.

Analyses of the data revealed some clear group differences in terms of sociological, psychological and educational features between the two groups of women; a number of these variables apparently have theoretical and practical relevance to the criterion variable. A brief summary of major group comparisons reveals that women with non-stereotypic aspirations:

1. come from homes with a higher income;
2. have mothers who have reached higher levels of education;
3. are more theoretically oriented (i.e., have a propensity for logical, analytical and critical thinking);
4. hold more liberal attitudes toward the role of women in society;
5. hold more liberal attitudes toward international relations among governments;
6. are higher achieving students both in high school and in college;
7. express a stronger liking for science and mathematics;
8. tend to have more communication with faculty concerning the academic and vocational aspects of their lives;
9. see benefits from their college experiences more in terms of vocational and liberal education benefits than other types of benefits;
10. participate in college to a greater degree in social service and academically oriented activities;
11. are less involved in artistically creative activities such as creative writing, dance, art, theatre and music; and

12. are more likely to be of Jewish background than of Protestant or Catholic background.

Some of these findings are discussed in more detailed fashion under appropriate sub-headings below.

Religious Background

Significant relationships were found between religious background and type of career choice. Catholic women predominately aspired to traditional careers, as did Protestant women to a slightly lesser extent. In contrast, the majority of the small number of Jewish women in the sample aspired to non-traditional careers. Table 2 shows the chi-square analysis of the group differences by the three major religious affiliations in this study.

TABLE 2

Percentage Differences in Religious Affiliation Among Women of Traditional and Non-Traditional Career Choices

Career Choice	Catholic (N=59)	Jewish (N=22)	Protestant (N=265)	Other (N=50)	No Response (N=26)
Traditional	84.0	36.4	79.2	66.0	75.0
Non-Traditional	15.3	63.6	20.8	34.0	25.0

$p < .001$

Personality Characteristics

In this analysis, "self," that part of the personality which interacts with role to determine behavior, is most directly revealed by the Personality Traits measure in the questionnaire. It consists of two checklists: one headed "I generally like," followed by two or three word descriptions of people and activities, and the other, "I am," followed by a list of adjectives. The items can be used individually as indicators of the way the respondent sees herself, or they can be clustered into scales (Autonomy, Complexity, Theoretical Orientation, and Anxiety) modeled by Pace and Trent after the Omnibus Personality Inventory for use in their original study.

The Autonomy scale seemed especially pertinent to this study; it seemed reasonable to expect women who plan to enter male-dominated fields to possess a relatively strong degree of autonomy, a characteristic defined in this context as independence of traditional authority. It also seemed reasonable to expect an individual who countermands society's expectations to experience some anxiety. Thus, relative to at least two of the Personal Traits subscales, Autonomy and Anxiety, it was anticipated that the non-traditional women would exhibit higher mean scores than the traditional women in the study.

As shown in Table 3, this was not the case. Scores on the Anxiety scale were virtually identical for the two groups. Although the non-traditionals obtained higher scores on the Autonomy scale, the difference was not significant. The Complexity scale, measuring tolerance for ambiguity and a liking for novel and complex experiences, did differentiate between groups, but the higher score on this scale made by the non-traditionals was not significant. The Theoretical Orientation scale, however, unquestionably differentiated between traditionals and non-traditionals, the latter group obtaining significantly higher scores than the former. The scale was composed of items describing relatively scholarly and scientifically disposed individuals with a propensity for critical, logical, analytical thinking.

TABLE 3

Comparison of Personal Traits Scores of the Traditional and Non-Traditional Career Groups

Scale	Group	Mean	df	t	p
Autonomy	Traditional Non-traditional	6.7 7.0	420	1.30	.19
Complexity	Traditional Non-traditional	13.7 14.2	420	1.40	.16
Theoretical Orientation	Traditional Non-traditional	6.49 9.04	420	7.50	<.001
Anxiety	Traditional Non-traditional	2.75 2.76	420	.08	.9

Because so many of the items comprising this scale were oriented to scientific interests, and since many of the non-traditionals were science majors who were planning on science-related occupations, an analysis of covariance was used to determine the relationship of Theoretical Orientation to career choice with the two science majors (biological and physical science) held constant. There remained, however, a significant difference between the scores of the two groups.

To determine if any of the individual items in the Personality Traits measure had any value by themselves, irrespective of the scales, a chi-square analysis was made for every item. Those items which significantly differentiated between groups on the basis of this analysis are shown in Table 4. Practically all of the items in the Personal Traits measures that were selected out belong to two of the sub-scales, Theoretical Orientation and Complexity, and the majority of these items are more characteristic of the non-traditionals than of the traditionals. Those which are more characteristic of the traditionals,

TABLE 4

Personal Traits Showing Significant Differences by Chi-square Analysis, and the Sub-scales to which They Belong (in parentheses)

Sub-scales[a] and Items	% positive responses in each group		df	x^2	p
	Trad.	N.-Trad.			
I generally am:					
Well organized[b] (C)	43.9	62.4	1	9.7	.01
Individualistic (C)	58.3	70.3	1	4.1	.05
Questioning (C)	59.12	71.3	1	4.2	.05
Predictable[b] (C)	29.9	18.8	1	4.2	.05
Determined[b] (A)	61.7	72.3	1	3.3	.10
Undistracted[b] (TO)	3.1	14.9	1	16.93	.001
Analytical (TO)	24.0	56.4	1	35.84	.001
Critical-minded (TO)	36.1	53.5	1	8.88	.01
Scientific (TO)	10.9	45.4	1	57.22	.001
Sociable[b] (TO)	77.9	62.4	1	8.8	.01
I generally like:					
Original research work (TO)	40.5	61.4	1	12.68	.01
Solving long, complex problems (TO)	22.1	37.6	1	8.84	.01
Critical considerations of theories (TO)	31.5	45.5	1	6.10	.02
Science and mathematics (TO)	18.4	49.5	1	37.24	.001
Discovering how things work (TO)	53.6	70.3	1	8.11	.01
Scientific displays (TO)	15.0	36.6	1	21.12	.001
Detecting faulty reasoning (TO)	34.9	64.4	1	26.19	.001

[a] C=Complexity, A=Autonomy, TO=Theoretical Orientation

[b] An answer of "false" on these items contributes to a higher score on the respective scales.

under the stem "I generally am," are "predictable" and "sociable," the former detracting from their Complexity scale score and the latter from their Theoretical Orientation scale score.

Attitudes

The Viewpoints section of the questionnaire has three parts, each measuring attitudes toward a different aspect of society. Four items comprising the Government index deal with nationalistic versus internationalist policies of the United States. The four items concerning women's role in society define the respondent's viewpoints about women as policy makers in business and government, as competitors with men in professional fields, and as housewives and mothers with outside occupational interests. The Civil Rights index deals with rights of the disadvantages and minorities, and repressive versus libertarian domestic government policies.

The Women's Rights index was of particular interest as a means of examining congruence between women's career planning behavior and attitudes about professional career women. Another use of the data on this measure was the comparison of the Women's Rights and Civil Rights indices to determine whether respondents would express the same degree of liberalism in their attitudes toward women as toward other oppressed groups.

As the data show in Table 5, some agreement does exist between behavior and attitudes toward women's rights. The non-traditionals scored significantly higher than the traditionals, manifesting more liberal attitudes on this index. The same group of women also scored significantly higher on the government index, again in the direction of liberalism. On the Civil Rights index, however, scores were almost identical, and they were higher than on the Women's Rights index. Apparently, the attitudes of both traditionals and non-traditionals were more liberal toward civil rights than they were toward women's rights.

TABLE 5

Differences Between Mean Scores of Women in Two Career Groups on the Viewpoints Scale

Scale	Group	Mean Scores	df	t	p
Government	Traditional Non-Traditional	2.29 2.63	420	2.77	.006
Women's Rights	Traditional Non-Traditional	2.43 2.87	420	4.15	<.001
Civil Rights	Traditional Non-Traditional	3.49 3.50	420	.06	n.s.

On this index, it may be noted that differences between groups are labeled significant even though they appear to be negligible. The reason for this involves the small number of items in each sub-index which considerably limits the range of possible scores.

School Typologies

Expectations were that the proportion of non-traditionals would vary by type of college. Specifically, the underlying hypothesis was that select liberal arts colleges and universities would attract a disproportionatly higher percentage of women aspiring to non-traditional careers. It was found that the percent of non-traditionals varies widely with type of school; state and teacher's colleges show the lowest percentage of non-traditional career aspirants (1.7 and 2.2 percent, respectively), and select liberal arts and engineering schools the higher (15 and 15.7 percent, respectively).

Beyond the comparisons among school types, however, comparisons of schools within each category reveal an even wider range of distributions. For example, within the select liberal arts category, the range of non-traditionals among institutions is from zero to 33 percent, and within the general university category, from 3.8 to 18 percent. Although engineering schools, select liberal arts, and universities have the highest proportion of non-traditionals, it appears that this variable, enrollment by type of school, may be no more critical in the examination of differences between traditionals and non-traditionals than is the individual school itself with its own set of unique environmental characteristics.

Educational Benefits

The Educational Benefits section of the questionnaire consisted of a list of statements expressing the more commonly sought goals or values one might derive from the college experience. These goals were divided into three categories: Vocational, Liberal Education, and Personal and Social Benefits. The respondents rated each statement on a four-point scale according to the extent she felt she had benefited on each during her college years.

It was anticipated that the non-traditionals would score higher on Vocational Benefits than on the other two indices because of the highly demanding nature of their career goals, which would seem to encourage a special awareness of and appreciation for the professional or vocational benefits over and above the cultural or social aspects of the college curriculum. However, the data, provided in Table 6, do not bear out that expectation.

TABLE 6

Differences Between Women in Two Career Groups on the Educational Benefits Perceived from Their College Experiences

Scale	Group	Mean Scores	df	t	p
Vocational Benefits	Traditional	.78	420	2.39	.01
	Non-Traditional	1.04	420		
Liberal Education Benefits	Traditional	1.32	420	3.06	.002
	Non-Traditional	1.83	420		
Personal Benefits	Traditional	2.26	420	.89	n.s.
	Non-Traditional	2.42	420		

In terms of relative value of the three benefits, both groups rated Personal Benefits first, Liberal Education second, and Vocational Benefits last. The non-traditionals apparently felt that they derived more value from all three of the benefits than did the traditionals. On two of the indices, Vocational and Liberal Education, the differences between groups were significant.

As discussed above, a very small number of items in an index can cause the difference between group scores to appear insignificant when in fact it is statistically significant. This applies to the Educational Benefits index as well as to the College Activities indices to follow.

College Activities

To determine if there were types of activities that non-traditional women engaged in to a greater degree than traditional women, an analysis was made of typical extra-curricular activities usually found on a college campus, categorized under the following headings in the questionnaire: Athletic, Creative, Government, Social Service, and Academic. The Athletic heading includes varsity and other sports; Creative activities include music, drama, arts and crafts; Government consists of participation in national political groups as well as student government; Social Service activities are those designed to serve the needs of others; Academic activities consist of membership in groups interested in school (or academic) related projects.

Results of t tests showed that the traditionals engaged more in Athletics and Creative activities than do the non-traditionals, although the differences were not considered to be significant. Social Service and Academic activities, on the other hand, did show significant differences, with more involvement on the part of the non-traditionals. Government activities were more popular with the non-traditionals, although differences in that category were not significant.

Sources of Assistance

One portion of the questionnaire was designed to determine 1) from whom the respondents most frequently requested assistance--faculty, counselors, or parents--and 2) the kinds of assistance they most needed--vocational, academic, or personal. It was assumed that the non-traditionals would appear less reliant in general upon others than the traditionals, since in their choice of careers they have expressed a degree of disregard for the "conventional wisdom" of others. However, the data did not substantiate this expectation.

The frequency with which upperclassman women sought assistance with their problems from counselors and parents was approximately the same for both traditionals and non-traditionals, with the exception of one instance, where traditionals more frequently reported seeking help with vocational plans from counselors. The only major statistical differences between groups was that more non-traditionals requested assistance from faculty members than did the traditionals, with problems related to their academic work, their abilities and interests, and their vocational and college plans. Both groups reported discussing practically all of their plans and concerns with parents more frequently than with either counselors or faculty members.

Critical Predictors

To this point, the reporting of the study has been concerned with differences between the two criterion groups: traditional and non-traditional career oriented women. In keeping with the theoretical basis of the study, a list of characteristics which best define the role of one or the other type of woman was formulated. By submitting the variables in the survey instrument to a stepwise multiple regression analysis, it was possible to produce a list of variables which, within limits of the available data, define the role of women belonging to one of the criterion groups.

Variables entered into the regression equation were selected on the basis of previous tests of differences (chi-square analyses and t tests); forty-one variables showing differences significant at the .10 level or greater were included. Academic major was excluded because it was frequently, and necessarily, directly related to career choice; it was instead considered as an integral part of the dependent variable, career choice.

As can be seen in Table 7, the Theoretical Orientation sub-scale from the Personal Traits scale was the strongest predictor in the multiple regression analysis. Two individual items from the same scale also maintained a high ranking on this analysis--grade average in college and "I like science and mathematics." Table 7 shows higher Beta values for the two latter items than for Theoretical Orientation, but this is possibly an indication of their strong relationship with the dependent variable, and not necessarily of a stronger predictive value in terms of probable influence on the dependent variable.

TABLE 7

Variables of Predictability on Criterion, Career Orientation, as Determined by a Stepwise Multiple Regression Analysis

Variable	% of Variance (R square)	Beta	Standard Error	F*
Theoretical Orientation Scale	.12	.11	.01	4.05
College grade average	.15	.17	.17	13.72
I like science and mathematice	.18	.21	.05	17.80
Viewpoints regarding the role of women in society	.21	.14	.02	9.85
Certainty of future job choice	.22	.13	.03	8.94
Requesting faculty help with academic problems	.23	.10	.04	5.38
Self-descriptiopn: I am analytical	.24	.11	.05	4.76

*All F values significant at .01 or better

Following "I like science and mathematics" in order of predictive value were: liberal viewpoints regarding women's role in society, certainty of future job choice, discussion of academic problems with faculty, and the self-description "I am analytical." All of the above, including higher grade averages in college, were more descriptive of the non-traditionals than the traditionals.

Other variables, such as vocabulary, religion, and socioeconomic status, which differentiated significantly on t tests and chi-square analyses, evidently do not have the predictive value of the seven discussed above.

When all the variables were entered into the multiple regression equation, however, only approximately 29 percent of the variance was accounted for. An obvious implication is that other variables, not included in this study, would improve the predictability of career choice. Consequently, the need for further research in this area is self-evident.

Conclusions and Recommendations

The assumption underlying this study was that career choices are largely a function of learned roles. With respect to the role learning process, education would seem to have some responsibility. Apparently, however, the educational system in this country has done little to expand women's awareness or interests beyond the sex stereotyped career roles revealed by the data.

Although the study found differences between traditional and non-traditional aspirants, there were no data signifying that women in the traditional group would be less able to perform in non-traditional occupations, and it is suggested that their choices have been influenced by their role expectations, as is true among other sub-groups in our society. Women seem willing, if not to cherish, at least to accept positions of occupational inferiority.

The point here is not to downgrade the position of teacher or others in the traditional category. The point is rather to suggest that women perceive a narrow range of career possibilities because they are fearful of venturing into a man's world, frequently doubting their capacity to fill masculine typed positions. It is also apparent that higher education evidently has little or no effect in changing the situation.

There are several implications for the higher education process and for college counseling to be gleaned from a composite of the foregoing information. Non-traditional career aspirants in the present sample requested assistance from counselors concerning vocational plans significantly less often than women of the traditional career group, but sought out contacts with faculty members more, perhaps indicating the desire for contact with a more appropriate role model. This finding could be a function only of the relative degree of certainty about future career goals between groups, but it may also mean that women who plan to enter male-dominated fields experience less satisfaction from their encounters with counselors.

Although the question cannot be clarified here, as there are no data regarding satisfaction with counseling services, other studies of career counseling indicate a stereotyped approach to women students, particularly among male counselors (Farmer, 1971). More specifically, Thomas (1967) studied the reactions of female and male counselors with female clients holding traditional feminine career goals and those holding non-traditional career goals. He observed that all counselors, but particularly the male, perceived the traditional feminine goals as being more appropriate.

Williams (1971), in a study of women medical students, wrote that women interested in medical careers are "more often than not faced with attitudes ranging from skepticism to downright disapproval." In her report of Radcliffe alumnae who enrolled in medical school, she found that one of the most critical problems faced by these women was the marriage-career conflict. Kaplan's (1971) recommendations for dealing with this conflict might serve as a model for all institutions involved with aspiring women professionals. Among them are: 1) flexibility in scheduling to allow for pregnancy and dependent children; 2) free nurseries for small children; and 3) financial help to cover mother surrogates during crisis periods.

It would be especially interesting to determine whether the range of career choices among all women would widen were these recommendations to be implemented in graduate schools as well as occupational institutions. One of the more frustrating features of the present study was the lack of information about underlying causes behind the respondents' limited number of career goals. Although no precise tabulation was made, a look at the data revealed a sufficient number of traditional career respondents who possessed the same composite of characteristics noted among the non-traditional respondents. Assuming that this group of traditional women were not all looking for stop-gap/until-marriage occupations, would they, given the facilitating supports recommended by Kaplan, attempt to enter less traditionally feminine fields? In other words, to what degree were their decisions formulated by apprehensions concerning homemaker-career conflicts? Ginzberg (1966) posed this apprehension as a potent element in the process of vocational choice for a woman, and added to it the inability to make realistic plans without knowing what kind of man she will marry. Will he want a large family? Will his business require her assistance? Will the geographical location or other particulars of his job impose constraints upon her career potential?

If our society were to evolve toward Rossi's (1964) ideal of androgynous role positions, these considerations would become as vital to men as they are now to women. For the present, however, sex status appears to be a salient factor in a woman's professional career, and too often she is expected (by herself as well as others) to subordinate her individualistic goals to those of her husband and family. In the words of Kluckhohn (1953), woman's role is still devoted to things "aesthetic and moral which busy men define as the nice but non-essential embroidery of American life."

POLITICAL PARTICIPATION AND CIVIL RIGHTS ATTITUDES OF COLLEGE ALUMNI: CLASS OF 1950

Paul Wayne Purdy*

Montesquieu (1748) forewarned that the tyrannical power of a prince in an oligarchy is not as dangerous to the public good as is the apathy of citizens in a democracy. Many years later, Shills (1961) noted, in a slightly different manner, that the problem for a democracy is the restraint of the rulers and the willingness of the citizenry to accept authority while taking a rationally critical attitude toward it. Critical appraisal of the government and active participation in its affairs are as relevant to the continued well-being of this nation and the world as they have ever been.

Crucial problems of every description abound in the United States; racial injustice, economic instability, environmental pollution, military conflict and increasing urbanization are among those warranting attention. But perhaps the greatest problem of all is the seeming absence of general concern for the democratic process and the lack of political involvement on the part of the educated and uneducated alike.

If issues are not resolved through the democratic process, solutions derived through other means will render meaningless the principles of democracy itself, resulting at best in paternalism in the name of liberty. One of the obligations of higher education in this country is to awaken and sustain political conscience and dialogue; another is to demonstrate through the study of history and social and political institutions that an awakened citizenry and enlightened leadership can accomplish great social reform.

---

*Ed.D., 1972.

Because racial discrimination has been a pervasive issue in American life since this nation was founded and has been the source of much social disruption, it appears appropriate to take notice of the attitudes college-educated people have about the rights of black people. Equally important is the fact that much of the plight of black Americans can be attributed to unjust laws, federal and state, that were enacted by representatives of the people. Indeed, the political process and racial discrimination have made for interesting bedfellows in American life (Bennett, 1969; Franklin, 1956).

In this report, analyses and findings concerning the correlation of selected background variables with political participation and civil rights attitudes of college alumni are discussed. Alumni from institutions in the Center data bank with response rates of fifty percent or more were selected, producing a total sample of 5,488 alumni from the class of 1950 from forty-nine colleges and universities.

Methodology

Two indices were used as criterion measures of political participation and attitudes toward civil rights. These indices were formulated from responses by the alumni to questions relative to their involvement in political activities during the year 1968, and responses to questions designed to obtain their viewpoints on civil rights issues.

The first index developed was the Political Participation Index (PPI), which contained seven activity items. The respondents indicated each of the activities in which they had engaged in the preceding year. The items in this index were as follows:

During the past year:

(1) I attended meetings of a political club or group.

(2) I did some volunteer or paid work for a political party.

(3) I contributed money to some political cause or group.

(4) I talked with an elected official about some problem (national or state).

(5) I signed a petition, wrote a letter, card, or telegram concerned with some political issue.

(6) I participated in a public protest or rally over some political issue.

(7) I held a political or public office (elected to or appointed, full-time or part-time).

Each item indicated was worth one point on the scale, the highest possible score being seven. Respondents indicating two or less items were classified as "low"; those indicating three or four were classified as "medium"; and those indicating five or more items were classified as "high" participants on the PPI.

Five items from the Viewpoints section of the alumni questionnaire were employed in the formulation of the Civil Rights Index (CRI). Three of the five items had particular or implied reference to poverty, injustice, and discrimination against blacks. The items, with keyed responses, are listed below:

(1) If Negroes live poorly it is in great part the fault of discrimination and neglect from whites. (agree)

(2) Anyone, no matter what his color, who is willing to work hard can get ahead in life. (disagree)

(3) More money and effort should be spent on education, welfare and self-help programs for the culturally disadvantaged. (agree)

(4) Issues such as law and order, civil rights, and public demonstrations are complex and need careful evaluation and judgment of individual cases. (agree)

(5) People who advocate unpopular or extreme ideas should be allowed to speak on college campuses if the students want to hear them. (agree)

Determining alumni scores on the CRI was accomplished by summing the total number of responses answered in the keyed direction. Those who answered four or all five items in the keyed direction were classified as having a "high tolerance" for civil rights, and those answering three items or less in the keyed direction were classified as having a "low tolerance".

Analyses

Political participation was found to be related to certain educational experiences, as those alumni who earned high grades, majored in the social sciences and humanities, participated in college political gruops and attended the high prestige liberal arts colleges and universities in the sample were found to be proportionately the most active in political affairs. There was also a statistically significant relationship between holding an advanced degree and active participation in politics.

Attitudes toward civil rights were found to be related to educational experiences in much the same manner as political participation. That is, alumni who majored in the social sciences and humanities, earned above average grades, were active politically during college and attended high prestige liberal arts colleges and universities had the largest proportion of their numbers responding in the keyed direction (liberal) on four or five of the items in the index measuring these attitudes.

Further, alumni who majored in the sciences, business and education were least likely to be included in the "high tolerance" category on civil rights attitudes or to be among those in the category of "high" political participation. These patterns of the relationship between certain characteristics appear to be consistent with finding reported in previous research (Calvert, 1969; Havemann & West, 1952; Spaeth & Greeley, 1970).

Religious beliefs and political identification are discriminately related to political participation and civil rights attitudes. The Jewish alumni in the sample were the most active politically, followed by those with no formal religious identification. Democrats and Independents were more active in politics than Republicans, and were also found to be more liberal on the issue of civil rights.

No appreciable differences were found between sex on either political participation or civil rights attitudes; male and female alumni were fairly evenly distributed on the PPI and CRI. On the PPI, this remained true when the analysis was restricted to those who had bachelor's or master's degrees, but at the doctoral level of degree attainment, males were proportionately more active politically than females. The data were mixed for the CRI when related to level of education. Females were decidedly more liberal at the bachelor's level, slightly more liberal at the master's level, and proportionately more conservative at the doctorate and professional degree levels than were males.

Rather distinct patterns of political participation and liberal attitudes were evident with reference to different income levels. Taken in the aggregate, higher proportions of alumni with moderate to high incomes were active in political affairs than were those of lower income levels. This pattern was evident with relation to tolerance for civil rights as well.

Controlling for party identification revealed that Democrats and Independents were essentially accounting for the greatest numbers of those with liberal attitudes as income increased. Proportionately, among Republicans, income did not differentiate as much as it did among Democrats in the percentage of alumni with liberal attitudes. Republican proportions ranged from 36.7 percent in the "high tolerance" civil rights category for the below-

$15,000 group to 43.1 percent for the $25,000 and above group; among Democrats the proportions ranged from 63 percent to 73.2 percent. The proportions for Independents ranged from 48.1 to 67.4 percent for the lowest and highest income groups.

Without controlling for other independent variables, the extent to which political participation and civil rights attitudes would correlate with different types of institutions was explored. It was found that alumni of select liberal arts colleges, universities, and general liberal arts colleges were more active politically and more tolerant on racial issues than were alumni of the other types of colleges. Slight differences were found to exist between state colleges and less comprehensive universities, general comprehensive universities, denominational liberal arts colleges, and engineering schools, though they could generally be grouped together. A disproportionate number of the alumni in this latter group of institutions were politically inactive and in the "low toleration" category on the CRI.

These differences by type of institution can be interpreted in a number of ways. The most plausible interpretation can be found in an earlier study by Pace (1963). Based on the results of a long-term investigation of differences in the atmospheres of thirty-two colleges as measured by the College Characteristics Index (CCI), he reported that, beyond a few common characteristics, colleges differ greatly from one another. Subsequent research by Pace (1967), based on his College and University Environment Scales (CUES), has provided further evidence of the diversity of college environments. These findings are apparently well supported by the differences between institutions on the variables used in the current study.

As may be seen in Table 1, the graduates of select liberal arts colleges appeared to have been the most active politically and less inclined toward

TABLE 1

Summary of Alumni Rankings on the Political Participation and Civil Rights Indices by Type of Institution, Reported in Percentages

Rank	Name of Index						
	Political Participation				Civil Rights		
	High	Medium	Low	% Total	High	Low	% Total
Type of Institution							
Select Liberal arts colleges	25.4	47.5	27.2	100	53.4	46.6	100
Select universities	24.3	46.2	29.6	100	45.0	55.0	100
General liberal arts colleges	22.8	45.0	32.2	100	41.5	58.5	100
State colleges and other universities	17.1	52.0	30.9	100	35.4	64.6	100
Engineering universities	16.4	48.9	34.8	100	32.9	67.1	100
Denominational liberal arts colleges	15.3	46.5	38.2	100	36.8	63.2	100

intolerant attitudes on civil rights; some 25.4 percent of the alumni in that portion of the sample ranked high on the PPI, and over half of them (53.4 percent) had high scores on the CRI. General liberal arts college graduates followed those of select universities on the CRI, but not on the PPI. Conversely, graduates of general universities followed the graduates of select universities in rank by percent in the "high" category on the PPI, but not on the CRI.

There appears to be little difference in the levels of political participation and attitudes toward civil rights for graduates of the remaining types of institutions represented by the sample. For example, 17.1 percent of the graduates of state colleges and other universities ranked "high" on the PPI, and 35.4 percent ranked "high" on the CRI. Graduates of denominational liberal arts colleges were slightly less represented in the "high" category of the PPI (15.3 percent), but slightly more represented in the "high" category of the CRI (36.8 percent) in comparison to graduates of state colleges and other universities.

Throughout the analyses, many factors were found to have significant correlations with political participation and civil rights attitudes. Consequently, it is inappropriate to infer that attendance at a particular type of institution by itself necessarily influenced the formation of a desire to participate in politics or the possession of liberal or conservative attitudes concerning civil rights. Yet, attendance at a particular type of institution cannot be dismissed as a possible influence on these attributes; differences do exist. It is possible that alumni selected institutions that were most compatible with their aptitudes, interests, values and socioeconomic status. If so, one could assume that their values were solidified more than they were changed.

It is obvious that students going to college from different backgrounds and attending colleges with different approaches to education will reflect different values socially, politically and educationally. It does not necessarily follow that one form of college experience is superior to another or that a graduate of one type of institution will not make as significant a contribution to society as his counterpart from another type. What can be said is that, viewed from the standpoint of American idealism as it is related to participatory democracy and respect for the rights of all citizens, graduates of certain types of institutions seemingly approach these ideals more than others.

Up to this point, data have been discussed which reflect relationships between several independent variables and the two dependent indices. In order to distinguish more clearly between the effects of these independent variables on each index score, the data were analyzed by means of a stepwise multiple regression equation containing twenty-seven variables. Results of those analyses are discussed below.

As revealed in Table 2, more than 5 percent of the variance on the PPI was accounted for by participation in college political groups. The next most significant contributing variable was annual income, accounting for an additional 2 percent of the variance; participation in politics had a tendency to increase as annual income increased. Explaining an additional 1 percent of the variance was identification as an Independent or nonpartisan. Size of community of residence and identification as a Republican were the next most influential variables; each explained an additional .5 percent of the variance.

TABLE 2

Stepwise Multiple Regression of Independent Variables on the Political Participation Index

Variable	Multiple R	R Square	R Sq. Change	Simple R
Participation in college political groups	.239	.057	.057	.239
Annual income	.274	.075	.017	.147
Independent or nonpartisan	.287	.082	.007	-.097
Size of community of residence	.297	.088	.005	-.053
Republican Party affiliation	.307	.094	.005	-.009
Level of education	.313	.098	.003	.090
Science major	.318	.101	.003	-.062
Northeast regional residence	.322	.104	.002	-.047
Democratic Party affiliation	.326	.106	.002	.086
Average college grades	.329	.108	.001	.083

As may also be observed from Table 2, succeeding variables, while statistically significant at the .05 level, contribute very little to the total variance on the PPI. The variables, level of education, science major, residing in the northeast, identification as a Democrat, and average college grades, each contribute about.3 percent to the total variance. In the aggregate, the ten variables listed above explained 10.80 percent of the total variance of 11.56. The remaining variables entered into the regression equation were statistically insignificant, and are therefore not included in the table.

Just as fewer than one half of the twenty-seven variables entered into the regression equation explained the variance on the PPI, fewer than one half of the variables had an appreciable impact on the variance on the CRI. Eleven variables made significant contributions to the total amount of variance accounted for on the CRI. From Table 3, it may be observed that identification as a Republican had the greatest influence on the variance of the CRI, accounting for nearly 10 percent of the total of 16.85 percent. This was followed by the social science major variable, which accounted for 1.6 percent of the total variance. The remaining variables appearing in the table are statistically significant at the .05 level, based on their F values, but contribute very little to the remaining variance.

The variables, level of education (1.46 percent), attendance at a select liberal arts college (.8 percent), average grade in college (.58 percent) and age (.41 percent), explain the greatest amount of the remaining variance. The other variables in Table 3 are statistically significant, but add little to the variance.

Having discovered which variables in this study were predictors of political participation and attitudes toward civil rights, attention was then turned to the relationship of the two indices to one another to discover

TABLE 3

Stepwise Multiple Regression of Independent Variables on the Civil Rights Index

Variable	Multiple R	R Square	R Sq. Change	Simple R
Republican party affiliation	.311	.097	.097	-.311
Social science major	.337	.113	.016	.166
Level of education	.358	.128	.014	.171
Select liberal arts college	.370	.136	.008	.113
Average college grades	.380	.142	.005	.131
Age	.382	.146	.004	-.091
No definite religious beliefs	.387	.150	.003	.097
Catholic	.391	.153	.002	-.031
Democratic party affiliation	.394	.155	.002	.244
Northeast regional residence	.397	.157	.002	.097

if they were truly measuring disparate traits. Controlling for the effect on the two indices by all of the independent variables in the list of predictors and using the CRI as the dependent variable, the entire list of variables was simultaneously entered into Stepwise Multiple Regression analysis at the first step. When this was accomplished, the simple correlation coefficient representing the relationship between the CRI and the PPI amounted to .025, a very low positive correlation.

At the second step, the PPI was entered into the equation subsequent to the original independent variables. The resulting correlation coefficient amounted to .055, meaning that with or without the intervening effects of the independent variables, political participation and civil rights attitudes are not highly related attributes.

Summary and Implications

The present study was essentially of an exploratory and descriptive nature. Certain background variables that appeared definitely related to political participation and attitudes toward civil rights were identified. However, the three basic categories of variables--educational experiences, group affiliation (political and religious), and personal characteristics--accounted for relatively small amounts of the total variance in scores on the PPI and CRI. This suggests that other unidentified factors explain the remaining variance.

Two variables did individually explain a large amount of the variance that was accounted for on the two indices: participation in college political groups accounted for the greatest amount of variance on the PPI, and identification as a Republican accounted for the greatest amount of variance on the CRI. Considering only these two variables, additional research might focus on factors that contributed to their development.

Such a research effort might begin by posing the following questions: (1) What factors give rise to the development of the political process value of participation in college political groups, which in turn correlated highly with political participation as an alumnus? (2) Does this behavior come about as a result of attendance at a particular type of college? (3) Are politically active college students active in politics during high school? (4) Are parents politically active during the individual's childhood? (5) How strong is the political process value within family and community groups during childhood?

Given these and similar questions, politically active alumni might be studied, controlling for each of the questions posed at each step in the analysis. Stepwise multiple regression analysis could facilitate such an analysis, in which variables related to several stages of personal development might be identified and tested against political participation as possible determinants of such behavior.

With reference to civil rights attitudes, one might attempt to isolate factors related to Republican affiliation. Key variables could be identified that are primarily associated with pre-college experiences and that are related to Republicanism. Using precise controls, the most important variables identified at this point in the analysis could be tested against college and post-college experiences to determine the relative influence of each on such a political identification.

The sample discussed in this report represents but a small portion of college alumni who have departed from institutions of higher education to reap the benefits befitting the college educated. The alumni studied here and thousands like them have achieved a reasonable degree of material wealth, and most are professionally secure in their occupations. Yet, advertently or inadvertently, many of them appear to have chosen to leave the affairs of government to the politicians and hold views concerning minorities, the culturally disadvantaged and persons espousing unpopular or extreme ideas that seem to inimical to democratic ideals.

Higher education is more than a transmitter of knowledge; it is a transmitter of values also. And it is the value questions that have concerned those in American higher education in recent years to an unprecedented degree. As related to this study, American higher education is called upon to give more than lip service to providing educational opportunities to Black Americans and other minorities. Some institutions are meeting the challenge; others remain recalcitrant and uncommitted. Aside from denying full educational opportunities to minorities, the recalcitrant institutions are denying their students and faculty the opportunity of communicating and interacting with individuals with whom they must ultimately live and work. Most future alumni will fare no better than the majority of alumni in this study on civil rights attitudes unless the value of racial equality is as much a part of higher education as are the values of quality scholarship and intellectual integrity.

Concomitant with the value of racial equality should be the value of participatory democracy. Political process values can be taught without the process itself becoming a political issue; but politicization may be preferable to apathy. As these data revealed, those alumni who participated in college political groups were prone to be more active politically and more tolerant on civil rights issues than those who did not participate. Continuing education programs for alumni and seminars for students designed to educate them on the political process and to develop a political consciousness would assist in imparting greater political awareness and, hopefully, political efficacy.

ALUMNI PERCEPTION OF EDUCATIONAL BENEFITS AS RELATED TO COLLEGE EXPERIENCES AND INSTITUTIONAL TYPES

Stuart Lee Farber*

The higher education experience provides an opportunity for academic and other environmental influences to merge and determine the setting in which a student's growth and behavioral development will take place. Exactly how the student and the campus setting interact remains unknown in any precise detail, but recent investigations offer suggestions as to the kinds and amounts of interaction. Increasingly, concepts are stated indicating that the value or success of a college experience is a result of the interaction process between students and the total college environment.

In the past, institutional evaluation has been accomplished primarily through faculty committees, accreditation teams, consultants, trustees' studies, alumni visits and similar activities (ACT, 1969). More recent studies have provided for student and alumni to serve as the population samples for institutional evaluation. Spaeth and Greely (1970) indicate that, "Alumni are, of all persons, especially qualified by past experiences to offer opinions on the ways in which college has served or failed to serve them."

The educational benefits students receive while at institutions of higher education logically relate to the kinds of experiences they have. These experiences can be related to a major field of study, a college residence, participation in extracurricular activities, counseling and advising sessions, and other experiences which are somewhat determined by characteristics associated with an institutional "type". The concept of differing "types" of colleges and universities is related to the understanding of a differentiation between institutional environments (Pace, 1963).

---

*Ed.D., 1973.

The setting or environment of an institution can be examined by observing individual student characteristics and those experiences provided by the institution. By examining the opinions of alumni, this study considers the value judgments of individuals who have persisted in college to an achievement level of at least the bachelor's degree. It thus offers an evaluation of educational benefits by college graduates and the relationship of these benefits to the institutional environment and other college experiences, such as extracurricular activities, residence, counseling, faculty advising and major field of study.

The above independent variables were selected for use in this study because of the importance that each is likely to have within the total college experience. As one examines a student's involvement in college life, it is found that his time is usually divided between classes, residence and participation in extracurricular activities. Additional student experiences can be found in discussions with counselors or advisors and in other experiences related to the environment of the institution. It is believed that by selecting these variables, those areas most likely to have influences on the graduate's perception of the educational benefits of the institution are being examined.

The population for this study included the entire sample of alumni in the Center data bank, which is composed of approximately 8,400 graduates from the class of 1950 from seventy-four institutions. For the purposes of this study, information was extracted from the following sections of the original Center alumni questionnaire: Educational Benefits, School and College Experience, and Personal Information.

Educational Benefits

The Educational Benefits section of the survey provided seventeen items related to typical objectives of a college or university. These items were: (1) vocational training, (2) specialization, (3) literature, (4) philosophy, cultures, (5) social development, (6) personal development, (7) critical thinking, (8) art, music, drama, (9) communication, (10) science, (11) citizenship, (12) individuality, (13) friendships, (14) vocabulary, facts, (15) religion, (16) tolerance, and (17) social, economic status.

For each item, the respondents were asked to mark either "Very Much," "Quite a Bit," "Some," or "Very Little," depending upon the extent to which they felt they were influenced or benefitted in that respect. For initial scoring purposes, a determination was made of the frequency of each response for each item.

The seventeen educational benefits were categorized into the following three classifications of benefits: (a) Vocational, including numbers 1, 2, 14, 17, (b) Personal and Social, including numbers 5, 6, 12, 13, 15, 16, and (c) Liberal Education, including numbers 3, 4, 7, 8, 9, 10, 11. In scoring these subscales, value scorings were determined in the same manner as was used for the individual items, and the sum of the items included in each of the subscales was divided by the number of items in each scale. The frequencies were then entered in distribution tables as a raw count, row percentage, column percentage and total percentage for each of the four values.

School and College Experience

The items referring to college residence allowed for six different replies from each respondent: dormitory, fraternity or sorority, rooming house, apartment, at home or with relatives or other. Two groupings of these residences were then made with respect to whether or not they were considered on or off campus. The dormitory and fraternity and sorority were considered, for the purpose of this study, to be "on campus" residences, while rooming house, apartment and at home or with relatives or other were considered to be "off campus" residences.

For determining the respondents' major while in college, each was asked to mark one of ten possible major fields of study: physical science or math, biological science, social science, language, humanities, arts, engineering, business, education, or other.

In determining the amount of student participation in extracurricular activities, each respondent marked "Much," "Some," "None," or "Not Available" for each of the following activities: varsity sports, other sports, publications, creative writing, dramatics, debate, arts and crafts, music, student government, religious groups, social service groups, fraternities or sororities, political groups, science clubs or projects, other academic groups, and foreign student exchange. For purposes of this study, the sixteen activities were grouped into the following activity classifications: (1) Athletic, (2) Creative, Artistic, (3) Government and Politics, (4) Social Service, and (5) Academic.

In the counseling section of the questionnaire, the respondents were asked to indicate whether they had ever discussed the following topics with a counselor, a faculty member, or parents: academic work, abilities and interests, vocational plans, college plans or choice of major, whether to go to graduate school, personal problems, and financial problems. For purposes of this study, all six counseling areas were utilized as categorized above.

Personal Information

The only information utilized from the Personal Information section of the questionnaire was the sex of the respondent. Institutional typology was patterned after the types explained in the introduction to this volume.

Based on these variables, the following hypotheses were set forth:

1. There will be a significant relationship of alumni perception of derived educational benefits with regard to:
    a. institutional types
    b. sex
    c. participation in extracurricular activities
    d. college residence
    e. college major
    f. professional counseling and/or faculty advising
2. There will be a significant predictability of educational experiences as related to alumni perception of derived educational benefits.

Analyses

An analysis of characteristics of the sample population showed that the largest number of respondents by major field was education with 1,326, followed by social science, 1,325; engineering, 1,238; business, 1,189; physical sciences and mathematics, 835; biological science, 627; humanities, 592; arts, 395; other, 356; and language, 248. The sample analysis also showed that males constituted almost two-thirds of the respondents, and that place of residence was nearly equally divided between those having resided on or off campus.

Included in the preliminary analysis were the frequency, mean, median and standard deviation for the educational benefit scores and a percentage distribution for each of the educational benefits. The mean scores of the educational benefits showed that generally the alumni placed rather high values on each of the seventeen educational benefits; the median of 2.813 of a possible 4.0 for all educational benefits showed a relatively favorable response.

In the original report of this study, numerous percentage distribution and chi square analysis tables were presented for each of the three categories of educational benefits--Vocational, Personal and Social, and Liberal Education. In this condensed version, three summary tables (Tables 2, 3 and 4) have been devised to show "profiles" of college experience factors which relate to the attainment of each of the three categories of benefits. Following those tables and discussions, results of multiple regression analyses to derive a linear combination of independent variables which might be used to "predict" the values of the criterion variables will be discussed.

Table 1 shows a percentage distribution for educational benefits by the eight institutional types in the study. The numbers and the percentages represent those respondents marking "Very Much" or "Quite a Bit" for each of the Educational Benefits subscales.

It is noted in Table 1 that within the Vocational benefits column the engineering colleges' percentage was highest with 77.2 percent, followed closely by the teachers' colleges with 76.9 percent. The lowest percentage was from the selective liberal arts colleges (63.4 percent). The selective liberal arts colleges were highest, however, in the Personal and Social benefits column with 74.4 percent, followed by the denominational liberal arts colleges with 72.2 percent. The lowest percentage in this category

TABLE 1
Percentage Distribution of Educational Benefits Score
by Type of College for Total Sample Population*

Type of Institution	(N)	Vocational Benefit	(N)	Personal and Social Benefit	(N)	Liberal Ed. Benefit
General Liberal Arts (GLA)	(1019)	66.0	(1035)	67.0	(1012)	65.5
Denom. Liberal Arts (DLA)	(573)	69.7	(573)	72.2	(533)	64.8
Selective Liberal Arts (SLA)	(462)	63.4	(542)	74.4	(565)	77.5
Teachers Colleges (TC)	(805)	76.9	(699)	66.8	(659)	63.0
State Colleges (SCOU)	(474)	74.6	(400)	63.0	(354)	55.7
Engineering (EC)	(843)	77.2	(445)	40.7	(484)	44.3
Selective Universities (SU)	(505)	67.6	(438)	58.8	(442)	59.3
General Universities (GU)	(1226)	71.9	(933)	54.8	(930)	54.6

* Percentage marking "Very Much" or "Quite a Bit" of Benefit

was from the engineering colleges with 40.7 percent. Within the Liberal Education benefits column the selective liberal arts type was highest with 77.5 percent, followed by general liberal arts with 65.5 percent. The lowest percentage was again from the engineering institutions with 44.3 percent.

It is of interest to note the variance of percentages within each column as well as between columns. For example, the engineering schools, which had the highest percentage on Vocational benefits, had the lowest percentages in both the Personal and Social and the Liberal Education benefits. Conversely, the selective liberal arts colleges had the highest percentage on the Personal and Social and the Liberal Education benefits, while showing the lowest percentages for the Vocational benefits.

Experience Factors Related to Educational Benefits

Table 2 shows the relationship between the various categories of the six college experience variables and the percentage of students marking "Very Much" of "Quite a Bit" of benefit on the Vocational dimension of the Educational Benefits Scale. The solid line through the middle of the table represents the mean percentage of all alumni within each broad category who indicated those degrees of benefit, while each of the twenty-six specific categories is graphically displayed by the percentage of alumni in that category who gave those same responses. For purposes of this summary analysis, responses to counselor and faculty contacts and college extracurricular activity participation were each put into two broad categories of "Yes" or "No".

As can be seen in the table, college major produced the greatest range of percentage responses for Vocational benefits, with more than twenty percentage points difference between the highest (biological science) and the lowest (humanities). There is also a ten percentage point spread between the five majors above the mean and the five below the mean, rather sharply distinguishing the two groupings. The least difference was found between those who resided on or off campus, showing only a slightly higher percentage for those who lived off campus.

Alumni who attended engineering schools and teachers colleges reported receiving more Vocational benefits than any of the other institutional types, followed closely by state colleges and other less comprehensive universities. Graduates of selective liberal arts colleges felt they had received the least benefits in this area, with general liberal arts graduates having received just slightly more.

TABLE 2
College Experience Factors Related to the Attainment of Vocational Benefits

Percent marking "very much" or "quite a bit" of benefit	Institutional Type*	College Major	Campus Residence	Counselor Contact	Faculty Contacts	Extra-Curricular Activities
		Biol.Sci.				
80						
		Engr.				
		Others				
					YES	
	ES	Phys.Sci.				
75	TC	Educ.				
	SCOU			YES		YES
			OFF			
70	GU		ON	NO		NO
	DLA					
	SU					
					NO	
65	GLA	Soc.Sci.				
		Langs.				
	SLA	Bus.				
60		Arts				
		Hum.				
55						
50						

* Code: See Table 1

Somewhat higher ratings of Vocational benefits were given by those alumni who had had counselor or faculty contacts and participated in extracurricular activities, quite noticably in the case of faculty contacts.

The spread of responses for Personal and Social benefits shown in Table 3 were much more extreme in all six of the primary categories than was the case for Vocational benefits. Again, college major provided the greatest range, just slightly more so than the institutional type. Language majors showed the highest percentage of favorable responses and engineering the lowest. The only other major decisively below the mean was physical science.

Selective liberal arts colleges and engineering schools again represented the two extremes for institutional type, but in this instance their ranks were reversed, with 75 percent of the former group of alumni having received what they considered a favorable degree of Personal and Social benefits and only 40 percent of the engineering school graduates indicating that to have been the case. The engineering schools were below the next lowest type of institution (general universities) by 15 percentage points, and were only one percent higher than the engineering majors in the college major category. Overall, the three types of liberal arts colleges and the teachers colleges were above the mean, and the engineering schools were below the mean.

A 15 percent difference was in evidence on this dimension to the advantage of those who had resided on campus and participated in extracurricular activities. This was just slightly less the case for those alumni who had experienced contacts with counselors and faculty members with relation to having gained Personal and Social benefits.

Differences in percentage responses on the Liberal Education benefits are shown in Table 4, where selective liberal arts colleges were again the highest and engineering schools the lowest. The selective liberal arts

TABLE 3
College Experience Factors Related to the Personal and Social Benefits

Percent marking "very much" or "quite a bit" of benefit	Institutional Type*	College Major	Campus Residence	Counselor Contact	Faculty Contacts	Extra-Curricular Activities
80						
75	SLA	Langs.				
	DLA					
70		Soc.Sci.	ON	YES	YES	YES
		Biol.Sci.,Educ.				
	GLA					
65	TC	Hum.				
		Arts, Bus.				
	SCOU	Others				
60						
	SU					
				NO		
					NO	
55	GU		OFF			NO
		Phys.Sci.				
50						
45						
40	ES	Engr.				

*Code: See Table 1

TABLE 4
College Experience Factors Related to the
Liberal Education Benefits

Percent Marking "very much" or "quite a bit" of benefit	Institutional Type*	College Major	Campus Residence	Counselor Contact	Faculty Contacts	Extra-Curricular Activities
80						
	SLA					
		Hum.				
75						
		Langs.				
70		Soc.Sci.			YES	
				YES		
65	GLA	Arts				YES
	DLA					
	TC		ON			
		Biol.Sci.				
60		Educ.				
	SU		OFF			
		Phys.Sci., Others				
55	SCOU			NO		NO
	GU	Bus.			NO	
50						
45						
	ES	Engr.				
40						

*Code: See Table 1

colleges were far above the next institutional type (approximately 13 percentage points) but the eight types of colleges and universities were divided in placement above and below the mean as was reported for the Personal and Social benefits. Majors showed a slightly larger range than they did for Personal and Social benefits, with humanities being at the top of the listing by percentages and engineering at the bottom, with the same percentage as reported by the engineering schools in the institutional type category. The other majors were fairly evenly distributed between these two extremes.

Only a slightly higher percentage of Liberal Education benefits was reported by those who had lived on campus, but differences were substantially to the advantage of those reporting to have had contacts with faculty members (a 16 percent difference) and counselors (a 14 percent difference). A 10 percent higher response was given by those who had participated in extracurricular activities while in college.

Summary of Experience Factors

In descending degree of relationship, the greatest Vocational benefits from college attendance most likely accrued to one who majored in biological science, attended an engineering school, had contacts with faculty members and counselors, and participated in extracurricular activities. Campus residence did not seem to discriminate between those having received benefits in this dimension. Those alumni who majored in humanities and the arts and attended selective liberal arts colleges reportedly received the least Vocational benefits from their college experiences.

Those alumni who were most prone to receive Personal and Social benefits attended selective liberal arts colleges, majored in languages, resided on campus, participated in extracurricular activities, and had contacts with faculty members and counselors. Attending an engineering institution and majoring in engineering, regardless of the type of institution, were the least related factors with these types of benefits.

Liberal Education benfits were received to the highest degree by those alumni who had attended selective liberal arts colleges, majored in the humanities, had contacts with faculty members and counselors, participated in extracurricular activities and lived on campus while they were students. As was the case for Personal and Social benefits, engineering institution and engineering major were the least related to this dimension of benefits.

Throughout all three types of benefits, college major and institutional type were the most prominent factors related to the percentage of positive responses. Selective liberal arts colleges were most related to the Personal and Social and the Liberal Education benefits, and engineering schools showed the least relationship. This order was reversed for the Vocational benefits. Engineering majors reported the least benefits for the Personal and Social and the Liberal Education benefits, but the most Vocational benefits.

Counselor and faculty contacts and participation in extracurricular activities were related to favorable responses on all three dimensions, while living on campus was significantly related to Personal and Social benefits, slightly related to Liberal Education benefits, and a negligible factor for Vocational benefits.

Multiple Regression Analyses

Nineteen variables were selected for purposes of multiple regression analyses; certain majors were combined (e.g., humanities and social science; physical and biological sciences; and vocational), and the activities were classified by certain types (e.g., academic, social and service, athletic, creative, and politics). The strength of the independent predictor variables on each dimension can be seen from their order in Tables 5 (Vocational), 6

(Personal and Social), and 7 (Liberal Education). Each of the six broad categories of experiences will be discussed below relative to their predictive value on each dimension.

Institutional Type. Multiple regression analysis showed that teachers college was the fourth strongest predictor for the Vocational benefits, engineering institution was the second strongest (negative relationship) for the Personal and Social benefits, and selective liberal arts college was the fifth strongest predictor for the Liberal Education benefits. Considering the multiple r coefficients and the r square percentages for all three criterion variables, type of institution was not considered as a strong predictor variable for the educational benefits criterion.

Activities. Academic activities were the strongest predictor variable for the Vocational benefits, and social and service activities were the strongest predictor variable for the Personal and Social benefits; while athletic and creative activities were third and fifth, respectively, for the latter dimension. Creative activity was the strongest predictor and academic activity the fourth strongest predictor for the Liberal Education benefits. It is of interest to note that although one particular type of activity was not consistently strong for all three of the benefit subscales, some element of activity participation was the strongest predictor for each of the three criterion variables.

Residence. This proved to be a relatively weak predictor variable for all three criterion variables. Overall, residence was not one of the college experience variables likely to influence perception of educational benefits, although favorable responses to educational benefits had a tendency to come from alumni who had lived in residences categorized as on campus.

TABLE 5
Multiple Regression Analysis of Vocational Educational Benefits and Selected Independent (Predictor) Variables

	Mult. r	r Sq.	r Sq. Change	Simple r	B	Beta	f Test
Activity-Academic	.185	.034	.034	.185	.978	.134	120.098
Major-Human./Soc.Sci.	.216	.047	.012	-.122	-.486	-.086	14.096
Faculty Advising	.241	.058	.012	.126	.665	.109	97.682
TC	.249	.062	.004	.083	.506	.064	26.726
ES	.254	.065	.003	.065	.419	.054	18.755
Counseling	.258	.067	.002	.053	.251	.048	19.504
Major-Phy./Bio.Sci.	.262	.069	.002	.095	.323	.047	5.564
GLA	.265	.070	.002	-.061	-.387	-.057	20.734
SLA	.268	.071	.002	-.056	-.450	-.049	15.896
DLA	.270	.072	.001	-.030	-.276	.032	6.942
Activity-Social/Service	.271	.074	.001	.070	.234	.031	6.401
Activity-Athletic	.272	.074	.000	.010	-.109	-.021	3.687
Activity-Creative	.273	.074	.000	.053	.147	.020	2.616
SC04	.273	.075	.000	.019	.152	.015	1.774
Residence	.274	.075	.000	-.017	-.023	-.014	1.727
Major-Vocational	.274	.075	.000	.034	-.109	-.021	0.753
Activity-Politics	.274	.075	.000	.044	-.014	-.002	0.032

For determining the .01 level of confidence, the f test must be equal to or greater than 2.57.

TABLE 6
Multiple Regression Analysis of Personal and Social Educational Benefits and Selected Independent (predictor) Variables

	Mult. r	r Sq.	r Sq. Change	Simple r	B	Beta	f Test
Activity-Social Service	.262	.069	.069	.262	1.456	.143	145.969
E C	.307	.095	.026	-.189	-1.358	-.128	65.336
Activity-Athletic	.338	.114	.019	.190	.791	.114	111.343
Faculty Advising	.356	.126	.012	.166	.703	.085	64.244
Activity-Creative	.368	.135	.009	.207	.506	.050	18.216
Major-Human./Soc.Sci.	.375	.140	.005	.147	.203	.026	11.443
Activity-Politics	.381	.145	.005	.215	.614	.072	37.592
Counseling	.386	.149	.004	.115	.488	.068	43.240
GU	.391	.153	.003	-.073	-.322	-.036	4.311
SU	.394	.155	.003	-.026	-.335	-.027	3.421
Major-Phy./Bio.Sci.	.396	.157	.002	-.070	-.628	-.067	12.365
SLA	.398	.158	.001	.105	.730	.058	15.022
TC	.399	.159	.001	.062	.507	.047	8.929
DLA	.399	.159	.000	.082	.359	.030	4.054
Residence	.399	.159	.000	.030	.035	.016	2.400
Major-Vocational	.399	.160	.000	-.088	-.196	-.027	1.434
Activity-Academic	.400	.160	.000	.113	.027	.013	1.189
GLA	.400	.160	.000	.073	.172	.016	0.904

For determining the .01 level of confidence, the f test must be equal to or greater than 2.57.

TABLE 7
Multiple Regression Analysis of Liberal Education Benefits and Selected Independent (Predictor) Variables

	Mult. r	r Sq.	r Sq. Change	Simple r	B	Beta	f Test
Activity-Creative	.239	.057	.056	.239	1.534	.128	114.858
Faculty Advising	.274	.075	.018	.172	.930	.095	77.204
Major-Human./Soc.Sci.	.294	.086	.011	.161	.706	.077	12.022
Activity-Academic	.310	.096	.010	.162	.994	.085	50.095
SLA	.320	.103	.007	.135	.949	.063	26.090
Counseling	.329	.108	.006	.107	.594	.070	44.076
EC	.336	.113	.004	-.128	-.930	-.074	29.495
Activity-Politics	.340	.116	.003	.171	.500	.049	17.069
Activity-Athletic	.342	.117	.001	.091	.285	.035	10.073
GU	.341	.118	.001	-.064	-.419	-.040	8.344
Residence	.344	.118	.001	-.016	-.065	-.025	5.660
Major-Vocational	.345	.119	.000	-.147	-.204	-.024	1.062
SU	.345	.119	.000	-.018	-.036	-.020	2.884
DLA	.345	.119	.000	.025	-.260	-.018	2.236
Activity-Social/Service	.346	.120	.000	.146	.214	.018	2.175
SCOU	.346	.120	.000	-.018	-.156	.010	.652
TC	.346	.120	.000	.027	.068	.005	.166
Major-Phy./Bio.Sci.	.346	.120	.000	.000	.068	.006	.100

For determining the .01 level of confidence, the f test must be equal to or greater than 2.57.

Major Field. Humanities or social science major was the second strongest predictor variable (negative relationship) for the Vocational benefits, the sixth strongest predictor for the Personal and Social benefits, and the third strongest predictor for the Liberal Education benefits. Considering only positive relationship with the criterion variables, humanities or social science major showed some measure of pervasiveness as a predictor variable for alumni perception of educational benefits, while vocational major and physical or biological science major proved to be relatively weak predictor variables.

Counseling. Regression analysis showed counseling experiences to be the sixth strongest predictor for the Vocational benefits, the eighth strongest predictor for the Personal and Social benefits, and the sixth strongest predictor for the Liberal Education benefits. Relative to these analyses, counseling demonstrated a pervasiveness throughout the criterion variables, and was thus considered a relatively strong predictor among the nineteen variables selected for the multiple regression analysis.

Faculty Advising. The regression analysis showed that faculty advising was the third strongest predictor variable for the Vocational benefits, the fourth strongest predictor for the Personal and Social benefits, and the second strongest predictor for the Liberal Education benefits criteria. It can be summarized that faculty advising demonstrated a pervasiveness throughout the regression equation analysis to such a degree that it can be considered the single strongest predictor variable with regard to the estimation of educational benefits.

Summary

The findings discussed above and supported in more detail in the original report of the study confirmed the hypotheses stated in the introduction, and lead to the following concluding statements:

1. Alumni perceived a rather positive value of the educational benefits of their respective colleges and universities. The highest values were placed on the benefits of vocabulary and facts, critical thinking, personal development, philosophy and cultures, and specialization. Nominal value was placed on the benefits of literature, social-economic status, communication, social development, individuality, science, toleration and friendships. Religion, citizenship, vocational training and art-music-drama were educational benefits given the lowest values.

2. There was a significant relationship between the educational benefits and institutional types, major field of study, counseling, faculty advising and extracurricular activities. Regarding residence, there was a significant relationship with the Personal and Social and the Liberal Education subscales, but not with the Vocational subscale.

3. There was a significant difference of perception of educational benefits for males and females with regard to institutional types and for the Personal and Social educational benefits related to residence, counseling, faculty advising and extracurricular activities. Little difference was found relative to the variable of major by sex.

4. There was a significant correlation between educational benefits and counseling, faculty advising and extracurricular participation.

5. The strongest positive predictor variables for the Vocational benefits were academic activities and faculty advising. For the Personal and Social benefits, the strongest predictor variables showing a positive relationship with the criterion variable were social and service activities, athletic activities and faculty advising. Considering the Liberal Education benefits, the strongest predictor variables were creative activities, faculty advising, humanities or social science major, and academic activities.

6. While significant relationships were found between educational benefits and the college experiences selected for this study, considering the statistical treatments of chi square analysis, correlation and regression analysis, the most significant relationship with educational benefits were found to be participation in experiences of faculty advising, extracurricular activities and counseling.

AN ANALYSIS OF OUTCOMES OF HIGHER EDUCATION*

Sonja Pauline Jacobson**

American higher education is renowned for its diversity, yet, there is a growing concern that colleges and universities in this country are becoming increasingly similar. Nearly all colleges and universities strive to perform the same generalized educational mission; traditional sources of differentiation --between public and private, large and small, secular and sectarian, male and female--are disappearing. Gradually, institutions with special missions are beginning to be replaced by modern universities and colleges which aspire to the university model. If one believes that an important function of the higher educational system is to offer alternative models, the homogenization of these institutions is a serious problem.

Previous studies have illustrated differential effects on college students which result from experiencing different higher educational environments. However, criterion measures in such studies have typically been heavily loaded with such academic components as graduate school attendance, scores on a battery of academic achievement tests, or college grade point average. The controls in most of these studies have likewise been of a purely academic nature, such as aspiration for an advanced degree, scores on academic aptitude tests, or high school grade point average.

The general purpose of this study was also to discover if alumni, in this instance twenty years after graduation, differed in definable patterns relating to the specific type of institution they attended. But, more specifically because of the importance of pre-college factors in the interaction process between students and the college environment, it examined post-college differences between certain alumni identified as having similar backgrounds which oriented them toward college attendance and predisposed them to a successful undergraduate college experience.

---

*The dissertation on which this condensed report is based was not available in its completed form before the publishing deadline for this volume, but its differing concern and approach were such that the editor included it to demonstrate another method of analyzing the alumni data from the Center's national study and to share some preliminary findings.

**Ed. Dissertation in preparation, expected 1973.

From the Center's alumni data bank, 3,547 male graduates from the class of 1950 from forty different institutions were selected for analyses. To insure representativeness between the eight types of institutions, the response rate of the alumni (only schools with a 50 percent response rate were included), the geographic location of the institution and the size of the undergraduate enrollment (insuring the inclusion of large and small schools) were considered in their selection. Alumni who did not attend the same institution for four years were removed from the sample so that the type of educational environment they were exposed to remained constant throughout their undergraduate experience.

From this sample, a select group of "college prone" male alumni were identified as the primary analysis group in order to compare alumni across institutional types who were similar on certain input variables. These alumni were drawn from the study sample on the basis of their responses to four items from the Personal Information section of the original survey questionnaire, which are listed below with keyed responses.

1. level of education obtained by parents (at least one college graduate)
2. number of books in parents' home (100 or more)
3. number of high school graduating class going to college (most, nearly all, or all)
4. high school grade point average (B+ or higher)

If the respondent answered in the keyed response category for three of these four items, he was included in the "College Prone" group. The 900 former students who were thus included in this analysis category were far from randomly distributed among colleges. The proportions of College Prone Males in the various types of institutions were as follows: Selective Liberal Arts Colleges, 51%; Selective Universities, 39%; Engineering and Science Schools, 34%; General Liberal Arts Colleges, 31%; General Universities, 21%; State Colleges and Other Universities, 19%; Denominational Liberal Arts Colleges, 14%; and Teachers Colleges, 13%.

In this study, the input control variable was academic, including both grade point average and peer and home environmental influences. However, the criterion or outcome variables dealt with both academic and non-academic concerns. With academic input thus equalized, it was anticipated that the non-academic benefits and activities described below would be more related to institutional type than would the academic benefits and activities. The outcome variables were included under three major groupings as follows.

Educational Benefits. This scale measured the amount of perceived benefits received from the college experience. The 17 items included in this scale were grouped into four dimensions for purposes of this study: Academic-Intellectual--vocabulary, critical thinking, science; Personal-Social--personal development, social-economic status, social development, individuality, friendships, tolerance, communication, religion; Humanistic--philosophy-cultures, citizenship, art-music-drama, literature; and Vocational--specialization, vocational training.

Activities. The eleven activity scales measured the extent to which people engage in certain kinds of activities dealing with a broad range of involvement in contemporary society and culture. These activities are considered a reflection of the alumni's interests, values, satisfactions and commitments related to broad objectives of liberal education--science, social science, arts and humanities. The content of the scales are behavioral definitions of these objectives. For each activity scale, the scores consists of the number of activities checked.

Progressive Thinking. This index is composed of ten items selected from the Changing Society scale of the Alumni Survey Questionnaire. Societal changes were described in each item and the alumni were asked whether they considered the change as generally desirable or generally undesirable. These items included changes regarding the role of the United States in world affairs, the free expression of ideas and dissent, the progress of minorities, opportunities for women, and the quality of the environment.

The portion of the study which was completed at the time of the writing of this condensed version included analyses of differences between College Prone Males and Total Males by the eight types of institutions on the four dimensions of the Educational Benefits scale and the degree of adult participation in the eleven activities between those groups. Other analyses being performed but not included in this report include the relationship between certain activities and benefits and differences between the two groups by institutional type on the Progressive Thinking Index.

Analyses

The eight institutional types were first ordered according to a measure of selectivity and academic environment, based on the percentage of College Prone Males in each institutional type subsample. Following that, rank orders were established for the types of colleges and universities on the basis of responses to the criterion variables by both the entire sample (Total Males) and the primary analysis group (College Prone Males).

Responses were categorized in the form of group scale means for the Activity scales and in the form of percentages of alumni from each group responding in the keyed direction for the Educational Benefits scale. The interpretation of these two rank order correlations presented for each of the criterion indices was based on the differences in degree and the direction of the two correlations with the initial rank order. Differences between the Activity mean responses and the Educational Benefits average percentages were also analyzed, but are not included in this report of the study.

The theoretical structure upon which the method was based involved expected differences in certain criterion variables between the Total Males and the College Prone Males. It was assumed that if one examined output in terms of the criterion variables with respect to the entire sample of males and then only those whose academic input was similar, the output rank orders would be different between each group by institutional type and the original rank order based on selectivity.

The differences between the initial and criterion ranks of the institutions were expected to be less for the College Prone Males because of their similar academic input and the manner in which the first ranking was arrived at. It follows that if the nature of an outcome variable was less related to the college prone input factor than to the college or university environment, then rank order differences between Total Males and College Prone Males on that criterion variable should be minimal.

Educational Benefits

With reference to Academic-Intellectual benefits, it can be seen in Table 1 that the total group of college males within each institutional type had a quite similar rank order compared to the original ranking by academic orientation.

TABLE 1

Institutional Rank Order Correlations on Input and Educational Benefits by Total Males and College Prone Males

Type	Input Selectivity	Educational Benefits							
		Academic-Intellectual		Personal-Social		Humanistic		Vocational	
		TM	CPM	TM	CPM	TM	CPM	TM	CPM
SLA	1	3	5.5	2	4	1	1	8	7
SU	2	4	5.5	6	7	5	5	5.5	5
ES	3	1	1	8	8	8	8	1	1
GLA	4	5	3	3	2	3	4	7	6
GU	5	6	7	7	6	7	7	5.5	4
SC	6	2	2	5	5	6	6	3	2
DLA	7	8	8	1	1	2	2	4	3
TC	8	7	4	4	3	4	3	2	8
Rank Order Correlation		.62	.12	-.20	-.50	-.05	.05	-.52	-.02

This Total Male group ordering correlated much higher with the academically ranked institutional types (.62) than did the College Prone group (.12). The large difference between the two correlations was most likely due to the reduction in range of the type of students and the comparison of varying sizes of groups. Consequently, when looking at only academically-oriented students on an academic variable, there was a reduction in the institutional differences resulting in less relationship between the two rank order correlations.

Unlike the Academic-Intellectual benefits, the eight benefits constituting the category of Personal-Social were not so obviously related to the criteria for selection of the College Prone alumni. Because of this, it was not surprising that a negative rank order correlation was found for the Total group on this dimension, and that this negative relationship was accentuated in the correlation for the College Prone group.

The least relationship with the academic orientation of an institutional type was found in the Humanistic benefits. The summary correlations shown in Table 1 were very near zero for both groups; Total Males showed a correlation of -.05 and the College Prone Males .05.

Although there was very little correlation between the academic ranking of the institutional type and the ranking on Humanistic benefits, the relationship between the correlations of the two groups was quite high. The rankings for the two groups on Humanistic benefits were identical except for ranks 3 and 4, indicating that although Humanistic benefits were not directly related to the academic ranking of institutions, there was a consistent influence of the college environment in the humanistic domain on both the general male student body and the select group of males.

A negative relationship existed for the Total Male group between rank order on Vocational benefits and the ranking of institutional types (-.52). For the College Prone Males there did not seem to be an appreciable effect of the academic orientation of the institution on the Vocational benefits, as that correlation was only -.02. One might expect this to be the case, since the more academic institutions do not usually orient themselves as directly toward vocational goals.

What was probably most significant about the pattern of responses to Vocational benefits was the wide difference in rank correlations between the two groups. For the select group of College Prone male alumni, there did not seem to be an appreciable effect of the academic orientation of the institution on the vocational benefits received by these alumni, whereas for the Total group, the level of academic emphasis of an institution seemed to have a significant negative effect on their perception of Vocational benefits.

Activities

In Table 2 it can be seen that negative correlations were found between the degree of the alumni's involvement in Community Affairs and the academic environment of the institutional type. The rank order correlation of the College Prone Males was -.85, a substantial negative correlation. The Total Male group also showed a negative correlation (-.52).

With further reference to this column of Table 2, it can be seen that alumni from teachers' colleges and denominational liberal arts colleges ranked seventh and eighth on academic emphasis and first and second, respectively, in their involvement in Community Affairs. The reverse is true for the selective liberal arts colleges and the selective universities, which ranked first and second in degree of academic emphasis and seventh and eighth in Community Affairs.

TABLE 2

Institutional Rank Order Correlations on Input and Activities by Total Males and College Prone Males

Type	Input Select.	Activities																					
		Comm. Affairs		Nat./St. Politics		Education		Inter-cult.		Inter-nat.		Art		Lit.		Music		Drama		Rel.		Science	
		TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM	TM	CPM
SLA	1	3	7	2	6.5	3	5.5	1	2.5	1	4	1	3	1	2	2	4.5	1	3.5	7	8	6	6.5
SU	2	6	8	4	4.5	8	8	5	6	3	6	2	6.5	3	5	5	8	3	5	8	7	7	4.5
ES	3	8	5.5	8	6.5	7	7	4	6	6	6	5	4.5	6	6	6	6.5	6	6.5	6	6	1	1
GLA	4	5	3	3	3	4	3	3	4	2	3	3	6.5	2	3.5	3	3	2	1	3	3	4	6.5
GU	5	7	4	5	1.5	6	4	6	6	7	6	4	4.5	7	7	7	4.5	4	3.5	5	5	2	3
SC	6	4	5.5	6	6.5	5	5.5	8	8	8	8	7	8	8	8	8	6.5	7	8	4	4	3	4.5
DLA	7	2	2	7	1.5	2	1	2	1	5	1.5	6	2	5	1	1	1	8	2	1	1	8	8
TC	8	1	1	1	4.5	1	2	7	2.5	4	1.5	8	1	4	3.5	4	2	5	6.5	2	2	5	2
Rank Order Correlation		-.52	-.85	.05	-.25	-.48	-.19	.50	-.19	.50	-.35	.90	-.25	.50	.27	.05	-.60	.60	.29	-.88	-.90	.02	-.07

The rank order correlations for the alumni's involvement in National and State Politics were also negative, although small (-.25), for the College Prone Males and insignificant for the Total Male group (.05). For the alumni's response to Educational activities, the correlation between the degree of involvement and the academic ranking of the institutional types was also small and negative for the College Prone Males (-.19), and insignificantly positive for the Total Males (.05).

Rank order correlations for both the Intercultural and International activities were again small and negative (-.35 and -.19) for the College Prone Males. Rank order correlations for the Total group in these two activity areas were both .50, showing larger differences between the correlations of the two groups than any of the first three criterion variables discussed, which together with these latter two form a general index of Civic and World activities.

As a result of correlating the academic ranks of the institutions and the rankings of the responses of the alumni to Art activities, a close relationship was found between these two rankings for the Total Male group (.90). There was a noticably different pattern which evolved for the College Prone Males which resulted in a correlation of -.25. There seems to be no plausible explanation for this strong discrepancy between the two groups.

Concerning activities in the area of Literature, the College Prone Males showed a small positive relationship of .27. The discrepancy between the two groups was not as large in this area of activities as it was for Art, with Total Males indicating a correlation of .50.

Music activities again showed a large difference between the two groups, with Total Males having a very slight positive relationship of .05 and the College Prone Males a strong negative correlation of -.60. In Drama activities, the Total Male group showed a correlation of .60, while the College Prone Males had a small positive relationship of .29.

There was only a slight difference between the rank order correlation for the Total Male group and that for the College Prone group for Religious activities; for both groups the relationship was very strongly negative (-.88 and -.90, respectively). The smallest correlations between alumni activities and academic level of the institution was found in the area of science. There were minimal relationships for both the Total group (.02) and the College Prone group (-.07).

Summary

On the basis of the analyses completed thus far, it can be tentatively concluded that there are differences between alumni who have experienced different higher educational environments, even when controlling for a "college prone" background, especially with respect to non-academic kinds of outcome variables.

REFERENCES

Abe, C. & Holland, J.L. A description of college freshmen: Students with different choices of major field. ACT Research Reports, No. 3, 1965.

American College Testing Program. Manual for the ACT institutional self-study. Iowa City: The American College Testing Program, 1969.

Astin, A. W. Some characteristics of student bodies entering higher educational institutions. Journal of Educational Psychology, 1964, 55, 267-275.

Astin, A. W. Who goes where to college? Chicago: Science Research Associates, 1965.

Astin, H. The woman doctorate in America. New York: Russell Sage Foundation, 1969.

Barger, B. The changing student. Paper presented to the First Annual Campus Life Conference of the University Religious Association, University of Florida, 1965.

Bennett, L. Before the Mayflower: A history of the Negro in North America, 1619-1969. Chicago: Johnson Publishing Company, 1969.

Bradley, W. N. An analysis of selected cognitive and non-cognitive variables relating to a student's persistence in a major area of study at Michigan State University. Unpublished doctoral dissertation, Michigan State University, 1962.

Bugelski, R. & Lester, O. P. Changes in attitudes in a group of college students during their college course and after graduation. Journal of Social Psychology, 1940, 12, 319-332.

Calvert, R., Jr. Career patterns of liberal arts graduates. Cranston, Rhode Island: Carooll Press, 196

Cole, J. W., Wilson, K. M., & Tiedman, D. V. Dispersion analysis and the search for educational goals in college: A study in duplicate. Journal of Educational Psychology, 1964, 55, 121-131.

Davis, J. A. Undergraduate career decisions: Correlates of occupational choice. Chicago: Aldine, 1965.

Farmer, H. Helping women to resolve the home-career conflict. Personnel and Guidance Journal, 1971, 49, 795-801.

Feldman, K. A. & Newcomb, T. M. The impact of college on students. San Francisco: Jossey-Bass, 1969.

Finney, H.C. Development and change of political liberatarianism among Berkeley undergraduates. Unpublished doctoral dissertation, University of California, Berkeley, 1967.

Flacks, R. Adaptations of deviants in a college community. Unpublished doctoral Dissertation, University of Michigan, 1963.

Foster, J., et al. *The impact of a value-oriented university on student attitides and thinking*. U. S. Department of HEW Cooperative Research Program Project, No. 729. Santa Clara: University of Santa Clara, 1961.

Franklin, J. S. *From slavery to freedom: A history of American Negroes*. 2nd ed. New York: Knopf Publishing Co., 1956.

Freedman, M. B. Changes in six decades of some attitudes and values held by educated women. *Journal of Social Issues*, 1961, *17*, 19-28.

Gamble, G. W. Pre-college experiences and curriculum changes by college students. *Personnel and Guidance Journal*, 1962, *40*, 561-564.

Ginzberg, E. *Life styles of educated women*. New York: Columbia University Press, 1966.

Guilford, J. P. *Fundamental statistics in psychology and education*. New York: McGraw-Hill, 1956.

Gurin, M., Nachmann, B., & Segal, S. The effect of the social context in the vocational counseling of college women. *Journal of Counseling Psychology*, 1963, *10*, 28-33.

Hale, L. B. *From school to college: A study of the transition experience*. Yale Studies in Religious Education, No. 11. New Haven: Yale University Press, 1939.

Havemann, E., & West, P. S. *They went to college*. Chicago: Harcourt, Brace and World, 1952.

Havinghurst, R. J. & Breese, F. H. Relation between ability and social status in a midwestern community. III. Primary mental abilities. *Journal of Educational Psychology*, 1947, *38*, 241-247.

Higher Education Evaluation Program, Center for the Study of Evaluation, Graduate School of Education, University of California, Los Angeles (C. Robert Pace, Director). *Higher education measurement and evaluation KIT*. Field edition, 1972.

Higher Education Evaluation Project, Center for the Study of Evaluation, Graduate School of Education, University of California, Los Angeles (C. Robert Pace, Director). *A user's guide to the institutional profiles*. 1970.

Hollingshead, A. *Elmtown's youth*. New York: John Wiley and Sons, 1949.

Iffert, R. E. Retention and withdrawal of college students. U. S. Department of HEW, Office of Education Bulletin, 1958, No. 1. Washington, D.C.: U. S. Government Printing Office, 1957.

Kaplan, H. Women physicians. New Physician, 1971, 20 (1), 11-19.

Katz, D. & Allport, F. H. Students' attitudes: A report of the Syracuse reaction study. Syracuse: Craftsman Press, 1931.

Kluckhohn, C. Dominant and variant value orientation. In C. Kluckhohn & H. A. Murray (Eds.) Personality in nature, society and culture. (2nd ed., rev.) New York: Alfred A. Knopf, 1953.

Lenski, G. The religious factor. Garden City, New York: Doubleday, 1961.

Medsker, L. & Trent, J. W. The influence of different types of higher public institutions on college attendance from varying socioeconomic and ability levels. Berkeley: Center for the Study of Higher Education, University of California, 1965.

Mehus, O. M. Academic achievement of college students in different kinds of extracurricular activities. Journal of Educational Sociology, 1934, 8, 50-56.

Miller, J. L. L. Occupational choice: The construction and testing of a paradigm of occupational choice for the college graduate. Unpublished doctoral dissertation, Florida State University, 1959.

Montesquieu, C. L. Spirit of laws. Translated by Thomas Nugent. New York: Hafner Publishing Co., 1949.

Mosteller, F. & Tukey, J. W. Data analysis, including statistics. In G. Lindzey & E. Aronson (Eds.), Handbook of social psychology. Vol. 2. (2nd ed.) Reading, Massachusetts: Addison-Wesley, 1968.

Nelson, E. N. P. Radicalism-conservatism in student attitudes. Psychological Monographs, 1938, 50, No. 224.

Newcomb, T. M. Personality and social change: Attitude formation in a student community. New York: Holt, 1943.

Pace, C. R. College and university environment scales: Preliminary manual. Princeton: Educational Testing Service, 1963.

Pace, C. R. The influence of academic and student subcultures in college and university environments. U. S. Department of HEW, Cooperative Research Project No. 1083. Los Angeles: University of Califoarnia, 1964.

Pace, C. R. Analysis of a national sample of college environments. Final report, USOE Project No. 5-0764. Los Angeles: Graduate School of Education, University of California, 1967.

Pace, C. R. An evaluation of higher education: Plans and perspectives. CSE Report No. 51, Los Angeles: Center for the study of Evaluation, 1969a.

Pace, C. R. College and university environment scales: Technical manual. 2nd ed. Princeotn: Educational Testing Service, 1969b.

Pace, C. R. Education and evangelism: A profile of protestant colleges. New York: McGraw-Hill, 1972a.

Pace, C. R. Thoughts on evaluation in higher education. Essays on Education, No. 1. Iowa City: The American College Testing Program, 1972b.

Pace, C. R., Trent, J. W., & Morey, A. I. Higher education evaluation instruments: Preview edution. Los Angeles: Center for the Study of Evaluation, University of California, 1970. (mimeo).

Panos, R. J. & Astin, A. W. They went to college: A descriptive summary of the class of 1965. ACE Research Reports, Vol. 2, No. 5. Washington, D.C.: Office of Research, American Council on Education, 1967.

Pierson, R. R. Changes of majors by university students. Personnel and Guidance Journal, 1962, 40, 458-461.

Prediger, D. J. Converting test data to counseling information. ACT Research Reports, 1971, No. 44.

Remmers, H. H., & Radler, D. H. The American teenager. Indianapolis: Bobbs-Merrill, 1957.

Rossi, A. Equality between the sexes: An immodest proposal. Daedalus, 1964, 93, 607-652.

Sarbin, T. Role theory. In G. Lindzey (Ed.), Handbook of social psychology. Vol. I. Reading, Massachusetts: Addison-Wesley, 1954.

Selvin, H. C. & Hagstrom, W. O. Determinants of support for civil liberties. British Journal of Sociology, 1960, 11, 51-73.

Sexton, V. Factors contributing to attrition in college populations: Twenty-five years of research. Journal of Genetic Psychology, 1965, 72, 301-326.

Shils, E. A. Social sciences and the law. In The great ideas today. Chicago: The Encyclopedia Britannica, 1961.

Siegel, S. Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill, 1956.

Sonquist, J. A. & Morgan, J. N. The detection of interaction effects. Ann Arbor: Survey Research Center, Institute for Social Research, University of Michigan, Monograph No. 35, 1964.

Spaeth, J. L. & Greeley, A. M. Recent alumni and higher education: A survey of college graduates. New York: McGraw-Hill, 1970.

Stark, R. & Glock, C. American piety: The nature of religious commitment. Berkeley: University of California Press, 1968.

Stern, G. G. Characteristics of the intellectual climate in college environments. Harvard Educational Review, 1963, 33, 5-41.

Stright, I. L. Some factors affecting college success. Journal of Educational Psychology, 1947, 38, 232-240.

Surette, R. Career vs. homemaking: Perspective and proposals. Vocational Guidance Quarterly, 1967, 16 (2), 82-86.

Thistelthwaite, D. L. Effects of college upon student aspirations. U. S. Department of HEW, Cooperative Research Project No. D-098. Nashville: Vanderbuilt University, 1965.

Thomas, A. H. Counselor response to divergent vocational goals of a female client in terms of acceptance, appropriateness and need for further counseling. Unpublished doctoral dissertation, Michigan State University, 1967.

Trecker, J. L. Woman's place in the curriculum. Saturday Review, October 16, 1971, 54, 83-92.

Trent, J. W. Catholics in college. Chicago: University of Chicago Press, 1967.

Trent, J. W. Revolution, reformation, and reevaluation. In E. E. Sampson & H. A. Korn (Eds.), Student activism and protest. San Francisco: Jossey-Bass, 1970a.

Trent, J. W. The decision to go to college: An accumulative multivariate process. Los Angeles: Center for the Study of Evaluation, University of California, 1970b.

Trent, J. W. & Medsker, L. Beyond high school: A psychosociological study of 10,000 high school graduates. San Francisco: Jossey-Bass, 1967.

Tukey, J. W. Analyzing data: Sanctification or detective work? American Psychologist, 1969, 24, 83-91.

Tyler, L. The psychology of human differences. New York: Appleton-Century-Crofts, 1956.

Vizents, B. & Pace, C. R. The national study of college students and alumni: An account of its procedures, benefits, and impact. CSE Working Paper No. Los Angeles: Center for the Study of Evaluation, University of California, 1973.

Warren, J. R. Self concept, occupational role expectation, and change in college major. Journal of Counseling Psychology, 1961, 8, 164-169.

Watley, D. J. & Werts, C. E. Career selection: Turnover analysis and the "birds of a feather" theory. Journal of Counseling Psychology, 1969, 16, 254-259.

Weiss, R. F. Student and faculty perceptions of institutional press at Saint Louis University. Unpublished doctoral dissertation, University of Minnesota, 1964.

Werts, C. E. & Watley, D. J. Determinants of changes in career plans during college. Sociology of Education, 1968, 41, 401-405.

Williams, P. A. Women in medicine: Some themes and variations. Journal of Medical Education, 1971, 46 (7), 584-591.

The work upon which this publication is based was performed pursuant to a contract with the National Institute of Education, Department of Health, Education and Welfare. Points of view or opinions stated do not necessarily represent official NIE position or policy.